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A MANUAL FOR TEACHERS OF PRIMARY SCHOOLS IN INDIA



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MANUAL FOR TEACHERS

OF

PRIMARY SCHOOLS IN INDIA

BY

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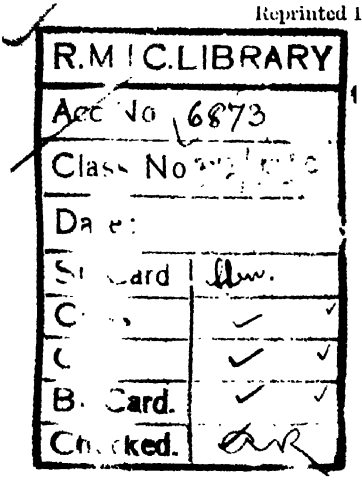
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PREFACE

This book is intended for use in institutions for the training of teachers for Indian Primary Schools. Many of the students of these institutions possess only primary qualifications; consequently the language in which it has been written is as simple as possible. Technical terms have been avoided in the text, but have been given occasionally in the margin, in order to enable instructors to consult books of reference.

Since, however, 'weakness never needs be falseness, truth is truth in each degree,' it is believed that the principles, which have been stated in their simplest form in the earlier or more theoretical portion of the book, embody recent ideas in psychological and educational science.

It is not uncommon in similar manuals to divide the book into two more or less distinct portions, the one chiefly psychological and dealing with general principles, the second part strictly practical and utilitarian. An attempt has been made in this book to break down this rigid dividing line between theory and practice by the use of concrete examples to illustrate the general principles, and by marginal reference in the chapters, which deal with the special

methods used in the teaching of the various subjects, to the passages dealing with the principles on which these methods are based.

As the method of teaching each subject of the primary school curriculum has been treated in great detail and in a simple, practical form, it is hoped that the book may also prove of use to teachers in active charge of primary schools, who have never had the advantage of attending a training school.

J. A. RICHEY.

NOTE.—The author has no pecuniary interest in this publication.

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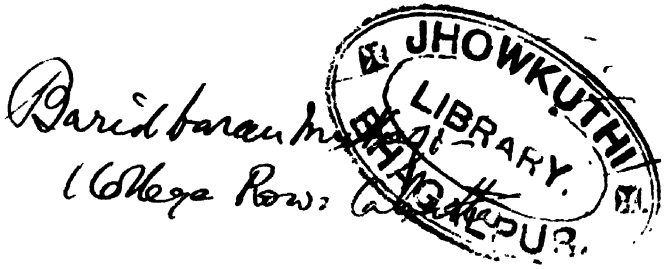
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CHAPTER I.

INTRODUCTORY.

Need for training.

1. To many who have not studied education professionally it appears that all that a man requires in order to become a teacher is the possession of sufficient knowledge of the subjects he will teach, together with those natural gifts of patience, power to keep discipline, etc., which clearly must be possessed by anyone who proposes to deal with a number of young children. These views are held not only by many outside the teaching profession, but also, unfortunately, by many who are engaged in the work of teaching; and it is for this reason more than for any other that the teaching profession is not so highly thought of or so well paid as are other professions. Doctors and lawyers can demand high fees because of the professional training which they have undergone. But the teaching profession is filled with a number of men who have received no technical training in teaching—indeed, many men take to teaching temporarily while studying in their leisure time for some other vocation. So long as this is the case we cannot expect the

public to honour teachers as specialists, or to pay them as such.

Dignity of teaching profession.

2. The teacher who does take his profession seriously, and study to make himself technically proficient, need not feel that it is in any way inferior to that of the doctor or lawyer. He has but to remember that, while the lawyer is chiefly concerned with the property and the doctor with the body, it is with the mind and character that the teacher deals.

Value of training.

3. No one can become recognised as a doctor without some knowledge of medicine, nor can a man practise at the Bar without some knowledge of law. How is it, then, that a man who has no technical knowledge of teaching can be recognised as a teacher? Because, though he may have had little to do with doctors or lawyers, he has been at school and can attempt to imitate the methods by which he himself was taught.

He may, if his own master had received no professional training, be able successfully to imitate his methods (which probably consisted of the reading aloud of the words of a text-book and the perfunctory correction of his pupils' mistakes).

On the other hand, if the master on whom he models himself was a trained and skilled teacher, he will soon find that a lesson from the point of view of a master is a very different thing from the same lesson as it appears to a pupil; the very simplicity and clearness of the lesson are due not to its inherent easiness, but to the master's skill

in explanation. He will then realise that the methods of a good teacher cannot be imitated except by one who understands the principles on which those methods are based. If at this point he does not decide to be trained for his profession, he must either fall into the easy methods above described of the untrained teacher, who practically lets the pupils teach themselves, or he must, if conscientious, attempt to evolve a method of his own. He may, if he has an inborn gift for teaching, evolve a fairly satisfactory method, but only after years of harmful experimenting on the minds of his pupils.

Recent recognition of need for training.

4. Now it has been generally recognised for many years that a man wishing to become a doctor must undergo a special course of training; but it is only in recent times, and that not generally, that the need for special training for the teaching profession has been recognised. The reason for this is that the science of medicine was discovered hundreds of years before the science of education. It is only after men have practised an art for a very long time, sometimes for centuries, that they realise the existence of certain rules of procedure which must be followed if their practice is to be successful. There still exist men who ignore the science of medicine, and profess to cure people without any knowledge of its laws; many more are there who teach, or profess to teach, without any knowledge of the science of education. And just as these self-taught doctors often succeed in curing people, so

do self-taught teachers often succeed in giving instruction. On the other hand, a wise father *will not entrust his child's body to an untrained* practitioner, if a trained doctor is available; nor will he entrust his child's mind to be taught by an unqualified man, if a trained teacher is available.

The teacher a skilled workman.

5. Although it is little more than 100 years ago that the main principles underlying education were discovered, by now many of the rules which all good teaching must follow have been discovered, and every teacher should know them. These are the rules of his art, according to which he must work if he would be successful. For the teacher is a workman, and has an aim for which he must work, material which he must shape, tools which he must employ, and rules which he must follow, just as any other workman. I shall deal with each of these conditions of the teacher's work in the following chapters.

CHAPTER II.

THE MEANING OF EDUCATION.

(*The Teacher's Aim.*)

Student to construct his own definition of education.

1. I shall not begin by giving a definition of education, because it will be much more profitable for a student to formulate a definition for himself, after he has read this chapter, in which he will see how the most common definitions are incomplete.

Education as a means towards passing examinations.

2. In the first place, if you were to ask a secondary teacher what was the aim of the teaching in his school, he would probably confess, even though he knew it was not a very high ideal, that the aim was to pass as many pupils as possible through matriculation. But this book is not dealing with secondary schools, and fortunately, whatever may be the case with secondary schools in this country, the efficiency of a primary school is not judged by the number of boys it passes successfully at any examination. We may leave aside then, as obviously wrong, the suggestion that the aim of primary education is to enable boys to pass examinations.

Education as a preparation not only for earning a livelihood but for life in general.

3. Again, if you were to ask the ordinary parent why he sends his boy to a primary school, he would probably reply that it was to enable the boy better to earn a livelihood. His idea of education, then, is the training of a boy to earn a living. But any teacher will know at once that, even if there is some truth in this, it cannot be the whole truth, because much that a boy learns at school does not bear directly on the way he proposes to earn his living afterwards. Indeed, those parents who keep their children out of school generally do so for the very reason that primary education does *not* give a boy the direct training (in agriculture, shopkeeping, or whatever it may be) which he needs to make a livelihood when he leaves school.

The reasoning of the first parent is wrong, because education aims at preparing a boy for the whole of life, and not only for earning a living. Beasts of burden are specially trained for their work, and then earn their food and shelter. But a man has many more interests in his life than merely food and shelter; he has his family, his friends, his amusements, and countless other interests, the number of which you will realise most easily by comparing your own life with that of a beast of burden. A man has also many powers both of mind and body besides those which he uses in earning his living, and to help him to make the best use of all his powers is the aim of education. Chap iii. 2.

The reasoning of the second parent is wrong

not only because he overlooks the importance of all these other interests and powers, but also because he assumes that education does not help a boy to earn a living. A man who cannot read or write must now-a-days be very dependent on others; and a man who has not learnt arithmetic at school must pick it up as well as he can out of school, otherwise he cannot even buy his food and clothes. But not only does education help a boy to earn a livelihood—it also makes it possible for him, if he has ability, to rise in life. Some of the greatest men the world has known have been the sons of poor parents and received their early education in village primary schools. Apart from these exceptional men you have only to look around you to see many men who are earning better livelihoods than their fathers did because they have received a better education.

Education as mental training.

4. Again many persons, especially teachers, describe the object of education as the training of the mind. Now, if this were the whole truth, it is obvious that it would not matter very much what a boy learnt in school or how much of it he remembered, provided that his mind was properly trained, and we should be wrong in examining him (as we do) to see how much he knows of the subjects which he has been taught. But it certainly does matter very much what subjects a boy learns and how much of them he remembers, nor would parents ever send their boys to school if they did not think they

were going to acquire some definite and useful knowledge.

Education as the training of character.

5. There is yet another view of the object of education which is particularly emphasised in schools of the older and more religious type, in which the pupils live with their teacher and follow his directions, not only in the work of school but in every detail of their daily lives. According to this view the aim of education should be the formation of a good character. Yet, if you consider the subjects which are taught in school, you will see that they have not been chosen for their direct influence on the moral character of the boys, but because a knowledge of them will be useful in after life. Moreover, it is impossible to deny that men of bad character who have been at school and college are more educated than those of good character who have never been to school at all.

Chap. vi. 4.

The fourfold aim of education.

6. After considering these four widely-held views of the aim of education, we conclude that the true aim is fourfold.

(i.) To equip a boy with the knowledge which will help him to earn his living, and which will enable him to get on in life if he has sufficient ability. This first, because the power to satisfy daily wants is the first need of all living things.

(ii.) To give him also that general knowledge which will enable him to enjoy life by making use of those powers of mind and

body with which he has been endowed by nature. And this because only by these larger powers is man differentiated from the beasts.

(iii.) To train his mind to use the knowledge which he has acquired, and to apply it to the various circumstances of life: because knowledge of which no use can be made is the valueless lumber of the mind.

(iv.) To build up in him by discipline, by precept, and by example, habits of right thinking and right doing, so that he may turn his knowledge and his powers to a good use.

These may seem large aims, but every teacher, whether he wills or no, does affect his pupils in all four ways. When, for instance, he teaches a boy to read, he gives him the power not only to read letters, bills, etc., which may be connected with his daily business, but also to enjoy books and to extend his general knowledge. If his teaching is intelligent, the boy will unconsciously acquire intelligent habits of thought. Finally, besides the habits of discipline and obedience which a boy cannot but learn in a well-ordered school, the matter of the reading-book must exercise a large influence on his view of life and his notions of right and wrong.

Summary of the aims of education.

7. Let us agree, then, that education should aim not only at preparing a boy for earning his livelihood, but also for life in general; and this

not merely by equipping him with a certain store of useful knowledge, but also by so training him that he may use that knowledge with advantage, and by so influencing his character that he will use it for good ends.

CHAPTER III.

THE MIND OF A CHILD.

(The Teacher's Material.)

Need for studying child nature.

1. No good workman would begin to build a house without knowing the quality of the material, whether wood, brick, or stone, with which he is going to work. But it is only in recent years that teachers have begun to realise that they should study the nature and character of a child before they try to teach him. The material with which a teacher works is the mind of his pupil, and the tools which he uses to shape and develop it are the subjects of the school curriculum. We commonly speak of 'teaching history, geography, arithmetic,' whereas it would be more accurate to say 'we teach children to learn history, geography, arithmetic.'

Chap. vii. 1.

Education impossible without co-operation on the part of the pupils.

2. A teacher cannot put knowledge into the minds of his pupils; he can only help them to acquire it. Teachers who do not realise this fact are often surprised to find how little of a subject, which they thought they had taught carefully, is understood by their pupils when they are tested

showing how boys think and feel. Fortunately, during the past few years much thought and study have been devoted to discovering the workings of a child's mind by experiment and observation. The results of this study are to be found in many helpful books on Child Nature.

(3) Observation of child habits.

6. But helpful as books are, it is chiefly upon his daily observation of the habits and conduct of his boys that the teacher must rely for his understanding of their thoughts and feelings.

In the following paragraphs you will find some of the general characteristics of a child's mind which have been discovered by great educators.

Incorrect view of a child as incomplete man.

7. It used to be thought that a child is just an incomplete man, with the same tastes and desires as a man, which are imperfect only owing to his immature state. Indeed, many teachers act as if they thought their pupils must feel their imperfection and be striving to overcome it. This is not so: a child's world is a very small world, but such as it is he is quite as content with it as you are with yours. A boy may be ashamed of his ignorance compared with that of other boys, when he finds himself at the bottom of his class, but no boy is ashamed of knowing less than a man. Some teachers try to make their pupils ashamed of their ignorance by displaying their own knowledge; they might just as well try to make their boys ashamed of not being six-foot tall.

Some of the chief characteristics of childhood (Psychology) (*a*) Helpful to the teacher.

8. Some of the chief characteristics of childhood which are common to all boys of six or seven (the usual age for entering a primary school) are the following:

(i.) Love of activity; restlessness.

Boys at this age have only recently learnt the use of their limbs, and they like to exercise them; so, too, they have not long since learnt to speak, and they like to use their voices, even if only in making a meaningless noise. See how little children like to run and jump and shout in the playground.

Just as they love to be active themselves, they are interested in living and moving things; first in people, then in animals, and finally in anything that moves. Most little boys would rather look at a live donkey than at a beautiful picture.

(ii.) Love of imitation.

In their games boys like to pretend to be doing what grown-up people do: *e.g.* riding, fighting, buying, and selling.

(iii.) Curiosity:

A little boy notices things about him more than men do, because he is not so occupied with his own thoughts and affairs.

These three characteristics of childhood are helpful to a teacher, and you will see later how they should influence his methods of teaching different subjects.

The following are three simple instances:

(i.) Since a child loves activity, the teacher should allow him to be active in school; he should encourage him to use his hands in drawing, modelling, writing, etc., and to use his voice in asking and answering questions. As children like moving things, he should, whenever possible, use real objects in Nature Study lessons instead of pictures. Chap. viii. 7 Chap xix. 8

(ii.) The teacher can use the children's love of imitation in the writing lesson by writing the copy himself on the blackboard while they watch him, instead of giving them copy slips. Chap. 5.

(iii.) The children's natural curiosity may be used in every lesson by means of judicious questions. Chap viii. 6

(b) Hindrances to the teacher.

9. On the other hand, the following three characteristics of childhood will cause the teacher difficulty in his work:

(i.) Acting on impulse.

Although naturally active, a boy acts on impulse and not of set purpose. He does not guide his actions by reason. It is the duty of a teacher to induce in his pupils the habit of acting for reasonable ends by reasonable means. Chap. iv. 2.

(ii.) Superficial observation.

Although observant, a boy does not think connectedly about the things he sees. Chap. xiv. 1.

He has little idea of cause and effect. A small child will ask you the name of one thing after another without trying to connect them, and will often forget your first answer in his interest in the next. It should be the aim of a teacher to make his boys see the essential relationships between things.

(iii.) Indefinite thought.

A child's notions of things are vague; he does not analyse or define them. He knows a word as a word, and not as a combination of syllables or letters. (The effect of this on the teaching of reading you will see later.) So, too, his ideas of objects are vague. He has perhaps a general notion of a camel, and if you show him a picture of a giraffe he will call it a camel. It is part of the work of a teacher to help his pupils to analyse their ideas and make them clearer.

General summary.

10. You will now have some idea of the child's mind, the material with which the teacher works. You have also seen that this material is not like clay, which the potter can mould into shape as he wills. It is active material, and the teacher can do no more than help the child's mind to form itself. To do this he must present his instructions in a form which is interesting and intelligible.

CHAPTER IV.

THE FORM OF INSTRUCTION.

(*Influence of the Teacher's Material on his Work.*)

Distinction between interest and amusement

1. In the first place, it is necessary to distinguish between what is interesting and what is merely amusing. Interest and amusement are often confused, especially by teachers, but in reality they are very different things. A good teacher is interested in his work, even in such a dull part of it as the keeping of clean registers, but it would not be true to say that he was amused by it. To make a lesson interesting, therefore, it is not at all necessary to make it amusing; on the contrary, if a teacher tries to make a lesson amusing he will very probably distract the children's interest. If, for instance, he is giving a dull lesson, and tries to make it interesting by telling a funny story, the children will probably remember little of the lesson afterwards except the story which amused them. If, on the other hand, the children are interested in a lesson, a story or a picture may help them to understand it better; but the teacher must

beware of thinking that the amusement which the children express at the story or picture is interest in the subject of the lesson.

A child's interests are immediate.

2. We feel an interest only in things of which we can see the meaning or purpose. Now, as you have seen, a small child does not look far ahead. He acts largely on the impulse of the moment. He cannot, therefore, be interested in things of which the purpose is remote. The younger he is, the more immediate are his interests. It is owing to this fact that the lesson periods for young children have to be shorter than those for older ones. Even if a small boy is interested in a lesson he cannot keep that interest up for any length of time. Every year, as he grows older, he will be content to undertake longer and longer tasks of an apparently dull nature, and will find them interesting just because he can see their ultimate purpose. So a man finds fishing interesting, although it may be hours before his patience is rewarded, and a hunter will find it interesting to tramp for days over rough country in the hope of shooting game.

Chap. iii. 9.

Chap. ix. 4, 5.

Definition of an 'interesting' lesson.

3. A lesson, therefore, to be interesting to a child must be one that is suited to the characteristics of his age, and must be one that calls for the willing exercise of his powers to gain an end which he can recognise as worth gaining. At first this end must be near, such as to write his own name, to read little words that he knows. But later, if the teacher makes clear to him the object to be attained, he is capable of more

Chap. x. 2.

Chap. x. 3.

Chap. xiv. 4.

sustained effort. Grammar is a dull subject, but boys may be made to take an interest in it if they realise that it will improve their power of composition. Chap. ix. 12.

Definition of an 'intelligible' lesson. (Apperception.)

4. Now what is meant by saying that a lesson should be made intelligible? It means that the new knowledge must be given in such a way that a boy can connect it with his previous knowledge and experience, and so appreciate its meaning. This needs a little explanation. You cannot explain the meaning of any new word to a person except by using words whose meaning he already understands. If he does not understand the words which you use in your explanation he will be no nearer understanding the word which you are trying to explain. And this is as true of ideas as it is of words. The ideas which a boy has already in his mind are the instruments with which he builds up new ideas. His idea of the size of an elephant, if he has never seen one, is gained by picturing to himself an animal larger than a buffalo which he has seen. A map is meaningless to a boy until you show him how places and physical features which he himself has seen can be represented on it. If he reads a story about a school, he will think of the school as being like his own, with such changes as the story or pictures in it suggest. So all new knowledge must be linked to the knowledge which a boy already possesses. When a boy comes to school he has a great store of general knowledge, but it is, as you have read in the last chapter,

Chap. viii. 5.

Chap. ix. 2.

Chap. viii. 1.

Chap. iii. 9.

vague and indefinite. The teacher makes the ideas in the boy's mind clearer, links them one to another, and then builds his new instruction on these foundations. The work of each class is built on that of the last, each lesson on that which preceded it.

General summary.

The teacher must take care when teaching his class something new

(i.) to find out what the boys already know bearing on the subject;

(ii.) to use words which they can clearly understand;

(iii.) to make sure that the boys understand each point before he proceeds to the next;

(iv.) to secure their co-operation, *i.e.* to keep the class interested in the work and anxious to go on with it; and this partly by using their natural activity, partly by showing them the value of the end to be gained.

CHAPTER V.

MEMORY.

(*Influence of the Teacher's Material on his Work*)

Value of memory.

1. Information of which no use can be made is valueless. No use can be made of information which is immediately forgotten. The teacher must, therefore, not only present his instruction in an interesting and intelligible form, but must also see that his pupils retain it ready for use when they have need. This they will do by the action of memory, which is the power of the mind to store up ready for use the experience and knowledge it has gained. Chap. ii. 6.

Two chief kinds of memory. (1) Verbal. (2) Rational.

2. There are two chief ways of remembering things; the one verbal, the other rational. When a boy repeats a verse of poetry his memory of it is mostly verbal, *i.e.* when he repeats one word the next word suggests itself; but it may also and should always be rational, *i.e.* he should realise that what he is repeating makes sense, and he should remember what the sense is. It should not be possible for him to put in a meaningless wrong word, just because the sound is similar to that of the right word. Chap. iii. 3

3. Boys are very fond of learning things verbally in order to avoid the trouble of remembering them rationally; but nothing should be learnt verbally till its sense has been thoroughly understood. For example, of what use is it for a boy to learn by heart the definition of a 'cape,' if he is unable to recognise a 'cape' either on a map or in real life. As soon as he understands the meaning of a 'cape,' then the learning of the definition may help him to keep a clear idea of it in his head. Similarly, in teaching the multiplication tables, the teacher should first explain how $4 \times 3 = 12$ means that four threes added together make twelve, before the class learn the three times table by heart. The process outlined in these two examples is the process that should be followed in all teaching.

Primary importance of rational memory.

Chap. xiii. 2.

Chap. xii. 6.

Not only is it very important for the proper understanding of what is learnt that every fact should be taught rationally before the boys are required to remember it: it is also very important for the proper training of the mind that this should be done. This point will be explained in the next chapter.

Chap. vi. 3.

4. At this point you may ask why boys should not be taught to remember things rationally only, and neither encouraged nor allowed to remember things by heart. Many people do indeed speak as if all memorising by heart was to be discouraged, and it is often said that the chief defect of the teaching in this country is that boys do not learn their lessons by reason, but by rote.

Uses of verbal memory.

Chap. iii. 3.

There is a good deal of truth in this criticism of Indian schools, but those who condemn this irrational learning are equally wrong in condemning all learning by heart. When we have once understood a fact to be true, we do not want to go over again all the reasons by which we know it to be true, every time that we use it. If we have once shown how 4×3 must be twelve, we are quite ready to accept this fact and to use it. We do not need the proof any more. It will save us a great deal of time to learn that fact and the rest of the three times table altogether by heart; so that, when multiplying by three, we shall immediately think of the right number without any effort of reason at all. In this way our verbal memory saves our mind trouble. It is just the same with actions of the body as it is with those of the mind. When a boy is learning how to catch a cricket ball, he must be shown how to stand and how to place his hands; but after a time, when a ball is thrown to him, his body and hands fall naturally into the right position, and he can devote all his attention to getting into the right place to catch it.

Chap. xii. 6.

Chap. xvi. 2.

Abuses of verbal memory. (a) Due to teachers.

5. So we teach boys by heart facts, whose meaning they thoroughly understand, which may be useful to help them in acquiring further knowledge. A teacher cannot, however, be too careful in seeing that boys do not learn by heart more than they actually require for this purpose. An excuse often offered by teachers for requiring boys to commit a great deal of useless matter to

heart is that such learning trains the memory. This stupid argument is due to ignorance of what is meant by a good memory. A good memory is not one that retains everything; but one that retains only those things which it is useful to remember, and forgets all that is only trivial or of temporary importance. We all do unconsciously forget that which our minds feel to be of no permanent value. No student, for instance, would be able to write down the figures of those examples in arithmetic which he has worked a day or two previously, although he might remember for weeks a line or two of poetry which he looked at neither so intently nor for so long a time as the arithmetic sums. In such a case his mind has instinctively rejected the figures as of no further use to him, while it has retained the poetry as possessing some permanent value. So a good memory is one that rejects the unimportant in order to fix more closely on the important ideas. The good teacher, therefore, should take care *not* that his pupils remember all that they learn, but that they do not burden their memories with that which is useless to them. Let us take a common instance: a little boy, when learning to read, is apt to remember the short sentences in the primer by heart; when he has seen the first word he is often able to say the whole sentence without looking at the book at all. Now it is important that he should remember the look of each *word,* in order that he may recognise it at once when reading; but the memorising of the

sentence is simply a useless burden on his memory.

(*b*) Due to boys.

6. It has been said that boys are more ready to learn things verbally than rationally: that is to say, they find it easier to remember the form of a thing than its meaning. It is common to find a boy giving an answer in history or geography in the very words of the book. But the importance of the historical or geographical fact lies in its meaning, and not at all in the form in which it is expressed. In other cases, such as multiplication tables, definitions, etc., which were given above, both the meaning and the form were of importance as steps to further knowledge; but in much of the work of a primary school (and nearly all the work of a secondary school) it is the meaning only which is of importance. p. 8.

Method of avoiding these abuses.

The teacher when giving instruction the meaning of which only is worth remembering, and not the form, should take care so to vary the form in which he gives it that the boys are unable to learn it by heart.

It is for this reason that the good teacher will not place text-books in the hands of little boys, and will not use the actual words of the text-book in giving a lesson.

Summary.

We conclude, then, that children should not learn anything by heart until they have thoroughly understood it, and above all that they should not learn anything by heart unless it is necessary that they should remember it in one particular form of words.

CHAPTER VI.

THE TRAINING OF MIND AND CHARACTER.

(Importance of the Teacher's Methods of Working.)

Incorrectness of the 'faculty' theory of mind.

1. Hitherto we have been considering the work of the teacher on the child's mind as consisting of the giving of instruction or new knowledge. But the aim of education is not only the giving of new knowledge, but also the training of the mind and character. Let us take first the training of the mind. A teacher is very apt to lose sight of this aspect of his work, or, if he does think of it at all, he comforts himself with the idea that the subjects themselves, which he teaches, give the necessary mental training. This belief is still generally held, and is found in many of the old books on teaching. We read in them that arithmetic trains the reason, geography the imagination, etc. It is, however, an entirely false belief, and is based on an old and incorrect idea that the mind of a child is split up into a certain number of so-called 'faculties,' each of which can be trained by one or more of the subjects taught

in school. Even without studying the real action of a child's mind, which is a long and difficult subject of study, you will be able to realise from your own experience how untrue this belief is. Arithmetic, for example, was supposed to train the 'reasoning faculty'; but if you think of the men of your own acquaintance who are clever at arithmetic, you will see that they are not any better reasoners than other men. Indeed, a man who is good at mathematics very often shows less judgment in the affairs of everyday life than a man who has no taste for mathematics at all. It is the same with the other subjects of the school curriculum and the faculties which they are supposed to train.

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Meaning of mental training.

2. By 'training the mind' we mean the formation of correct habits of thought. We have seen that when children come to school they are guided chiefly by impulse, and do not guide their actions by reason for reasonable ends. It is the duty of the teacher to train his pupils to use their reason. This will at first be no easy task. A boy much prefers to accept definite statements on the authority of his teacher or the text-book, without judging of their correctness. He prefers to learn a definition by heart, or to work out examples in arithmetic according to a fixed rule, without troubling to think about the meaning and value of the definition or rule. But unless a boy acquires the habit of using his own judgment in school, the knowledge which he has learnt there will be of little use to him. The problems

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with which he will be faced in life will not be labelled 'multiplication,' 'division,' 'geography,' 'grammar,' etc., and if he has not been trained in school to use his judgment in facing similar problems his knowledge of definitions and rules will stand him in little stead.

How the mind is trained. (cf. Heuristic method, Herbartian theory, etc.)

3. This training of the mind in school is effected not by the subjects themselves, but by the manner in which they are taught. Stupid, unintelligent teaching produces stupid, unintelligent children. The teacher should require the children to use their own reasoning powers to gain new knowledge. Starting with the knowledge which the children already possess by experience (or as the result of previous lessons) the teacher should lead them on by judicious questions to discover new facts or connections between facts for themselves. This rather difficult point will be illustrated in various chapters dealing with the methods of teaching. But there is one form of error which is very prevalent among teachers which may be mentioned here. Teachers are inclined to think a lesson skilful which conceals its object, and in which the children are led from point to point till they discover at the end what the aim of the lesson has been. Although the end of such a lesson may be interesting, the whole course of the lesson was evidently neither intelligible nor interesting to the children, who were left groping in the dark. There was no room in such a lesson for the children to use their reason in co-operating

with the teacher for the desired result. The teacher should always give the children at the beginning of the lesson an idea of what they are going to learn. Do not mistake the giving of a name, of which the class do not know the meaning, as a sufficient explanation of the subject of the lesson. For example, if the teacher is going to give a lesson in division, it is not sufficient for him to say to the class 'You are now going to learn division.' The boys do not know what division means and have very little interest in finding out. But suppose the teacher were to say 'If I had twenty apples to divide among you, how many would you each get?' the boys are interested immediately. They have learnt addition, subtraction, and multiplication, but will see almost at once that none of these methods will give them the right answer. The teacher may then say: 'I will show you a very simple way of finding the answer,' and the class will be ready to follow him with interest. By following this plan the teacher is calling in the judgment of the pupils to help him and is giving them a purpose, *i.e.* an interest in their work. Having started to learn division in this way, they will understand its meaning and its use, so that they will be able to apply it when necessary to the ordinary problems of life. This is the reverse of the practice usually followed, which is first to teach a rule and then to show its uses. The teacher should lead the children to feel the need of a rule before he gives it to them.

Meaning and methods of training the character.

4. By the 'training of character' we mean the formation of right habits of action. Few teachers realise the enormous influence they exercise over their pupils; indeed the pupils themselves are largely unconscious of it. Observe how the pupils of a master who talks in a loud voice are also apt unconsciously to talk in a loud voice. And if this is true of little habits of speech and action, it is equally true of moral habits. If a schoolmaster is invariably punctual and expects his boys to be so, they will acquire the habit of punctuality. Of course the punishment of an individual boy for unpunctuality exercises a strong moral effect; but it is not nearly so effective as the gradual establishment of the habit of punctuality. You yourself do not steal, not because you know thieves are punished, but because in your youth you acquired the habit of respecting the property of others. It is the same with other moral habits, such as cleanliness, tidiness, truth-telling, patience, etc. The teacher who not only enforces these virtues by rules and punishments, but who expects them of his pupils, and, above all, illustrates them in his own person, will inculcate the practice of them as unconscious habits in his pupils. All men wish instinctively to be like their neighbours; they like, for instance, to wear the same clothes as those of their own caste or society. So children naturally adopt the habits of those around them. If a schoolmaster has established the habits of cleanliness and tidiness in his school, a new-comer,

however dirty his own home may be, will very soon try to be as clean and tidy in school as the other boys; and when he goes out into the world on his own account these good habits will remain with him.

Formation of ideals.

5. There is another way in which a school can affect the moral character of a boy, and that is by giving him ideals. If every boy's highest idea of bravery or kindness was derived only from the instances of kindness and bravery which he has met with in his own experience, it would in many cases be no very high ideal, because his experience is small. At school a boy reads of deeds of heroism and of men who spent their lives in doing good to others, and he thus gains much higher conceptions of bravery and kindness. This subject is too large a one to be treated in this book; but you will probably remember instances in your own life in which your actions have been influenced by the example of the people about whom you have read in books. All good readers contain stories illustrating moral acts; and the good teacher will use them to raise his pupils' ideas of goodness. But a teacher should never forget that practice and example are far more effective than preaching.

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CHAPTER VII.

THE SUBJECTS OF THE SCHOOL CURRICULUM.

(The Teacher's Tools.)

The teacher like a good workman should know the uses of his tools.

1. You have now some idea of the aim of the teacher's work and of the material on which he works; before proceeding to describe the methods he should follow in his work, we must briefly consider the instruments which he uses, namely, the subjects of the school curriculum, for you will remember that the teacher works on the minds of his pupils with the subjects which he teaches. Now, though you will not yourself have the power to select the subjects which you will teach in a primary school, it will help you in your work if you understand the reasons for which they have been selected. A carpenter must use a hammer, nails, etc., which are supplied in shops, but he would not be able to do much work if he did not know the objects for which those instruments are made.

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Chap. ii. 3.

2. In the first place, you must remember that a primary school aims at fitting a boy for life in

The work which the tools are intended to produce

general; it does not claim to train him specially for the particular work which he will follow in order to earn a living. This special training is given to him afterwards by his parent or employer, or in a technical or secondary school. If, for instance, he is to be trained for Government service, he must study English; if he is to become a patwari he must learn the elements of surveying. These studies are the tools which shape him for his special work in life. But the aim of a primary school is to give a boy that general foundation which all people living in the present age in this country should possess; it also aims to make him fit by knowledge, training, and character to receive and make the best use of that special training for his life-work which he will afterwards receive.

Particular uses of the teacher's tools.

3. Now, what are the subjects which form the foundation of all knowledge and which must be taught in a primary school?

(1) Language.

The first is language. A boy entering school for the first time has already received at home, both directly and indirectly, instruction in his mother tongue. Although such instruction is not put down as a separate subject in the primary school curriculum, yet the teacher should remember that it is one of his chief duties to extend the vocabulary of his pupils. By increasing their knowledge of words, he increases their power of thought. Every teacher knows how much harder it is to explain some simple thing to the 1st class than it is to explain it to the 4th class; and this

is so, not only because the general knowledge of the 1st class boys is so much smaller, but also because the number of words they understand is so much smaller. Every new word that a boy understands and learns is like a step to new knowledge. For example, it is only when a boy has learnt the meaning of the word 'level' that he can learn that water always finds its own level. If he then learns that this is a property of all liquids, and the word 'liquid' is explained to him, he will know afterwards, when anything is described to him as a liquid, that one of its properties will be to find its own level. The words 'level' and 'liquid' are thus steps in his knowledge, and it would be impossible to give him a proper idea of any liquid he had not seen until the meaning of those two words was clear to him.

Chap. IX. 1. (2) Reading.

4. The chief instrument for the teaching of language in school is the reading lesson, and this is very properly considered the first lesson in the school curriculum. We extend our knowledge partly by observation of our surroundings and by experience, and partly by hearing from others about things which are outside the limits of our observation and experience. But if these were the only methods of acquiring knowledge, a boy brought up in a poor family, whose experience of the world is not much wider than his own, would have a very limited knowledge. Reading is the key which opens to us the storehouse of the knowledge of the whole world, and, once a boy

has learnt to read, the limit of his knowledge depends entirely on his own taste, ability, and means to procure books. Reading has also of course a very practical use in ordinary life, and no matter what occupation a man follows, the power to read will be of value to him.

(3) Writing.

5. It is unnecessary to explain the practical use to a man of the power to write, even if he is only able to sign his name or to write a letter. But writing also gives us a second means of expressing our thoughts, other than by the use of spoken language: just as reading gives us a second means of learning the thoughts of others other than by hearing them expressed in speech. The ability to write is also necessary before any wider studies are commenced.

(4) Arithmetic.

6. Arithmetical questions arise every day in the life of every man, and one who has not learnt arithmetic at school must pick it up for himself, or he will not be able to buy articles to satisfy his daily wants. A knowledge of arithmetic is also a necessary preliminary to the study of a great mass of further knowledge, especially those subjects which are grouped under the name of science.

Chap. ii. 3.

(5) Nature study.

7. Nature study (which includes object lessons) opens to us a wide field of interests, by helping us to understand the natural world about us. It teaches us the causes of the natural events which we meet with every day. It is also the foundation of several studies, such as that of physical science.

Chap. xiv. 2.

(6) Geography.

8. A knowledge of the geography of his immediate surroundings is necessary for every man. But a further knowledge of the geography of his province and country widens his understanding of men and things. A knowledge of geography is also necessary for the study of history and other similar subjects.

Chap. xv. 1.

(7) Drawing.

9. Finally, the power to draw can be turned to account in numerous ways in every walk in life. But drawing also gives us a third means of expressing our thoughts other than speech or writing. A knowledge of drawing is also necessary for many studies, such as surveying and engineering.

Reasons why these subjects are selected for a primary school.

10. These are the ordinary subjects of the primary school curriculum, and you will see that they have all been selected for three reasons:

(i.) because they are practically useful in life, whatever means of livelihood we pursue;

(ii.) because they widen our outlook on life;

(iii.) because they form the foundation of all further studies.

The different subjects are only selections of one knowledge whole (Correlation).

11. Now, although the work of the school is thus divided up into subjects in order that the boys may concentrate on certain sides of knowledge in certain periods of the school time, the knowledge which each man possesses and uses in life is a whole, and not divided into sections. The influence of this fact should be shown in the teacher's work. He should remember that the division of knowledge into subjects is made for

purposes of study only, and he should connect one subject with another as far as possible in his teaching. This is much easier for the elementary teacher, who takes his class in all subjects, than for the high school teacher, who may have to take several classes in one subject only.

12. It is easy to see that reading and writing are closely connected, and how the mention of geographical names in a reading lesson calls naturally for a reference to the map; but the good teacher will go further than this. For instance, when the children have been studying a plant in their nature study lesson, in the next drawing lesson they should be required to draw that plant. The geography lesson will often furnish problems in distance, population, etc., which can be used in the arithmetic lesson.

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CHAPTER VIII.

SOME GENERAL RULES OF METHOD.

(General Rules of the Teacher's Art.)

Chap. xvii. 2.

The teacher should map out his work for the whole year.

1. At the beginning of the school year the teacher should draw up for himself a programme of the work to be done during the year. This programme should show how much of each subject he intends to teach to his class in each month, and should allow periods for revision at regular intervals, as well as a definite time at the close of the year for the revision of the whole work. If he has to take several classes, as is generally the case, he should draw up such a programme for each class. If he has assistant teachers under him, he should, in consultation with each teacher, draw up such a programme of work for his guidance. When such a programme has once been drawn up the teacher should adhere to it as closely as possible, though divergences from it may sometimes be found necessary. The curriculum for each class has been carefully drawn up by the Education Department, to include just so much work in each subject as

an average boy may be expected to cover in a *school year. And yet teachers, through lack of such a programme, often find that they have* completed the work laid down for the whole year in a subject long before the year is ended, while others find themselves unable to complete it by the end of the year. Obviously the teaching in the first case has not been thorough: probably the teacher has devoted his attention to the brighter boys in the class, who can learn quickly, and neglected the dull ones. Laziness or incompetence may generally be ascribed to a teacher who cannot complete the course in the required time.

General rules for constructing time-tables.

2. Besides a general programme of work to be covered during the month, the teacher should have a time-table showing the time to be devoted to each subject each day of the week. The preparation of a time-table for a primary school in which the master has to take several classes simultaneously is not an easy matter, and will be dealt with in the chapter treating of the special difficulties met with by primary school teachers in this country. Chap. xvii. 3.

There are certain general rules which should be followed in drawing up any time-table for a primary school:

(i.) The length of each period should not, if possible, exceed forty-five minutes, and, in the case of infant classes, should not exceed thirty minutes. There should not be more than two and a half hours Chap iii. 8.

consecutive work without a break for recreation.

(ii.) The more difficult subjects, *e.g.* arithmetic, should come early in the day when the children's brains are untired.

(iii.) Two lessons involving writing, *e.g.* transcription and composition, should not be consecutive. Change of position keeps the children alert and relieves cramped muscles. For example, (*a*) after sitting during a writing lesson the children may stand for a reading lesson; (*b*) after written arithmetic they may stand for the questions in mental arithmetic. For this reason, the best time for drill is in the middle of the morning.

(iv.) A lesson in which the hands are used, *e.g.* drawing or copy-writing, should not, if possible, immediately follow the break, as children's hands and arms are shaky after exercise.

(v.) There are some subjects for which time cannot be found every day, *e.g.* geography. The periods for these lessons should be arranged at regular intervals throughout the week. For example, if three periods weekly are allotted to geography they should fall on Monday, Wednesday, and Friday, or on Tuesday, Thursday, and Saturday, not on three consecutive days.

The teacher must prepare his lesson.

3. Not only should a teacher have a programme of work for the day, but he should never take a lesson without having a definite idea of what he proposes to teach in the period at his disposal. Elaborate notes are usually prepared for the lessons which a teacher gives in the training school, and a teacher is often given to understand that he is expected to prepare similar notes for all the lessons which he will deliver in his own school. But every teacher knows that when he actually starts work in his own school he has neither time nor inclination after a heavy day's work to prepare elaborate notes for all the next day's lessons. The training-school notes of lessons are a useful exercise for the teacher, and form a guide for him of what a model lesson should be. When a teacher has prepared a number of these notes during the course of his training, and has also had the opportunity of criticising many others drawn up by his fellow-students, he should have a clear idea of what a good lesson should be.

Chap. xvii. 2.

Notes of lessons.

4. In solving a written sum in arithmetic we do not put down on paper every process of thought, but only those facts and figures which we cannot carry in our heads, and which are necessary for a clear understanding of the sum; similarly, such notes as the teacher may make for the lessons which he is going to give in school should emphasise those points which he is likely to forget. A young teacher should prepare all his lessons carefully, though he need not necessarily make many written notes. For instance,

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in preparing the reading lessons for the next day, it will be sufficient for him to read the lessons through, and underline those words and passages which will require special explanation, or which the children are likely to mispronounce. But for lessons such as geography, nature study, and arithmetic, it will be well for him to write short notes: if he relies wholly on his memory or the inspiration of the moment he will often find that, owing to the strain on his attention while taking the class, he has omitted some of the most important points, or forgotten some good illustration which he had meant to use. If he keeps such notes carefully during the first year of his work, and adds to them any special points which may arise during the course of his lessons, he will find himself at the end of a year or two equipped with a complete guide to his work. When he is thoroughly experienced, and has taught the same lessons for many years, he is justified in omitting written notes; all that he needs to do is to read through his old notes, and he will at once remember the difficulties which he experienced when he last taught the lesson.

Chap. iv. 4.

General form of lessons.

(1) Preparation.

5. The actual form which a lesson will take must necessarily depend upon the subject of it; but a certain general outline should be followed in most lessons. The teacher will begin by questioning the children, to bring out that knowledge on which he will base the new information. The questions will be partly on the matter learnt at the last lesson, partly on such experiences,

bearing on the subject of the lesson, as the children may have had outside school. The teacher must take care not to turn this part of the lesson into a revision of the last day's work. This is not the time to test the children's memory of what they have learnt, but only to prepare them for the new work by bringing before their minds those ideas which will help them to understand it. He will then tell them plainly what they are going to learn in the present lesson, taking care to describe it in such a way that they can understand it and feel interested. Chap. vi. 3.

(2) Presentation. (Use of questions.)

6. In presenting the new ideas, he must secure the co-operation of the children as much as possible. This he will do chiefly by means of judicious questions leading them on to the point which he wishes to reach. The art of skilful questioning is one of the most important properties of a good teacher. Very rarely should the question asked be one to which the answer is a simple 'yes' or 'no'; because even an inattentive child will often get such an answer right. The questions should be such as will require some thought on the part of the children. For this reason questions on the subject of a reading lesson should be asked at the close of the lesson, and not after each few sentences, when the children will have had no time to forget what they have read, and will, as is often the case, answer in the words of the book, showing a merely verbal memory of the passage read and no intelligent knowledge of its meaning. All the information Chap. iii. 2. Chap. iv. 5.

which a teacher wishes to give *cannot, however,* be elicited by questions; *e.g.* no amount of questioning will elicit from children a word which they have never seen or heard before. The teacher should not be afraid of giving the children such information directly; but he must beware of falling into the opposite extreme, the worst of all faults in a primary teacher, that of lecturing to the children as if they were college students. We have already seen the great importance of securing the co-operation of the children, if they are to learn anything; and such a method of teaching not only fails to secure their co-operation, but also ignores their natural characteristics of curiosity and love of activity which have been described. Finally, the close of the lesson usually takes the form of applying the matter learnt, *i.e.* showing its general utility.

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(3) Application.

It is obvious that this traditional form of a lesson cannot be followed with any closeness in such lessons as reading, writing, etc.; but we may learn from it that the teacher should first make sure of the previous knowledge of the children, and prepare their minds for the new matter, secondly, that he should keep them interested and active by means of questions which require thought; finally, that he should show the children the value and use of what they learn.

7. It is usual for all the questioning in school to be done by the teacher, whereas out of school the children are generally the questioners and their parents the answerers. No doubt it is right

The children should be encouraged to ask questions.

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that the bulk of the questioning in school should be done by the teacher, as the questions which he asks are expressly directed to exercising the intelligence of his pupils, and are also arranged so as to lead up to some definite point of new knowledge. But there is no reason at all why the children should not ask the teacher questions. On the contrary, it is quite unnatural for them to be forbidden to do so. The teacher will find the effectiveness of his work enormously increased if he allows his pupils to ask for information on points which are not clear to them. If the class is large the work may be delayed by constant interruptions on the part of the children, if there are no restrictions imposed on the right of children to question the teacher; in such a case it is best for the teacher to set aside a few minutes in the middle and at the end of the lesson, in which he answers difficulties which the children have felt. But with the small classes in a primary school the children should be encouraged to ask intelligent questions throughout the lesson. Of course care must be exercised that the children do not ask silly or irrelevant questions; but this habit can soon be checked by a good teacher. The boys should be told to hold up their hands if there is any expression in their reading lesson, any point in his explanation of an oral lesson, any difficulty in their written work, which they are unable to understand. When a suitable pause occurs in the lesson the teacher will answer their difficulties.

This system tends to correct the dulness and apathy which is so general a characteristic of boys in a primary school in this country. The boys are commonly not allowed to speak or act for themselves, but are obliged to depend wholly on their teacher.

Use of illustrations. (The blackboard.)

8. Another cause of the dulness of work in a primary school is the fact that the teaching is almost entirely through the ear: ocular teaching being very much neglected. Now, in our ordinary life we learn nearly as much from what we see as from what we hear. Few teachers realise how little an oral explanation of an object which they have never seen conveys to young children, who have so little experience of similar objects to help them to understand it. Think how hard it is for you yourself to understand the explanation of a machine, *e.g.* a reaping machine, if you have never seen the picture of one, although you have seen many machines of other kinds. Many explanations of animals, scenery, etc., which the teacher gives in the clearest manner possible, are equally unintelligible to children: they cannot form a mental picture of the objects described. Let the teacher, then, use illustrations as much as possible in his work, and call in the eye to help the work of the ear. The use of printed illustrations by the teacher will depend largely on the amount of equipment with which the school authorities supply him: but natural objects are generally obtainable and will often be useful. One form of illustration is always at the teacher's disposal,

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namely, blackboard illustrations. It is sad to see how the use of the blackboard is neglected in Indian schools. There is no lesson in which the *blackboard should not be in constant use.* The teacher should practise drawing rapidly small maps, pictures, and diagrams to illustrate his teaching; and should also, during a lesson, note on the blackboard those difficult words or points which the children are likely to forget. The teacher should not write on the blackboard all the points in a lesson, but only those which it is important for the children to remember, and which they are most likely to forget.

After skill in questioning, skill in the use of the blackboard is the most important property of a good teacher.

Discipline. The teacher must not mistake apathy for attention.

9. Discipline is fortunately not a serious problem for an Indian teacher. The boys are generally well-behaved and keen to learn. But a teacher must not mistake peacefulness and orderly behaviour for attention: it may, and only too often does mean complete mental apathy. If a teacher who is genuinely trying to make his lesson interesting by means of questions, illustrations, etc., still finds his class dull and apathetic, he should first look to the atmosphere of the room. He will very probably find that, owing to closed windows, the room has become stuffy and made the children sleepy. If this is not the cause, let him consider whether after all the children have not failed to follow the purpose of his lesson, and lost their interest. In any case,

the immediate remedy is, *not* to get cross with the boys, but to give them a change of *position*, if possible a few *simple drill* exercises either in class or in the compound. To go on with the lesson when a class is in this dull state of mind is simply waste of time.

Some general notes for maintaining discipline.

10. Though the teacher of an Indian primary school may seldom be confronted with the task of keeping discipline, in the sense of keeping an unruly class in order, yet it is well for him to have clear ideas on the subject, which he may use in case of emergency. Some general rules are appended for his guidance:

(i.) Remember that the attitude taken up by you in the first few months of your teaching is all important. If you once allow the boys to treat you without proper respect, or to acquire habits of slovenliness or unpunctuality, you will find it a long and difficult task to make them understand that you mean to put a stop to such behaviour.

You will do well to learn the names of your pupils as soon as possible. Merely to address a boy sharply by name will often check misbehaviour. Most boys do not like to be brought into undesirable prominence before their fellows.

(ii.) Indiscipline generally arises from want of work, or lack of interest in the work. If the time of the boys is fully occupied with interesting work there is little

likelihood of disorder. Discipline does not consist in the repression of a boy's natural activities, but in the directing of them into a profitable channel.

(iii.) Make as few rules as possible, but see that they are implicitly obeyed. It is much better to inflict a few severe punishments when the rules are first infringed than to be constantly setting small punishments for their frequent infringement. The constant infliction of punishments is a trial to the temper of both master and pupils. If the few rules which you have laid down are recognised by the boys to be clearly reasonable, a few strict punishments for their infringement at the beginning will establish them once and for all. Boys respect a master who knows his own mind.

(iv.) Try to be just and impartial. It is impossible for a master not to be prejudiced in favour of his brighter and more hard-working pupils, but he must try to avoid showing this prejudice. Nothing discourages a boy so much as the feeling that his teacher does not take as much interest in his work as in that of other boys in his class. There is no great merit in producing good results from the brighter and keener pupils; the good teacher is he who can get good work out of the naturally stupid or lazy pupils.

(v.) *Never strike a boy.* (This does not refer to cases where corporal punishment is necessary for serious moral offences, *e.g.* petty theft.) If a boy is stupid, he becomes more so when he fears a blow. If he is lazy, he would much rather be hit and have done with it than be set to do the work again out of school.

(vi.) The best forms of reward are those which are immaterial: such as badges, monitor stripes. Appoint as monitors of the classes not necessarily the brightest boys, but those who have done the best work according to their abilities. A monitorship should be the reward of good work, not of natural cleverness. It is a good plan to change the monitors at intervals, say of a month, in order to reward those boys who have made special effort.

CHAPTER IX.

THE TEACHING OF READING.

Aim of the teaching of reading.

1. The object of teaching reading is to give children the power to understand the written thoughts of others, just as they learn spoken language in order to understand the spoken thoughts of others. This object should be kept clearly before a teacher's mind, since the form that reading lessons take often misleads a teacher as to the first aim of his teaching. There are three subsidiary things which can be taught in a reading lesson: (i.) pronunciation, (ii.) the art of reading aloud, or elocution, (iii.) grammar and oral composition. These are all useful, indeed essential, parts of the teaching of reading, but they are not the first object, and must not be put by the teacher in the first place. There is yet a further object to be aimed at in the reading lesson, namely, to give the boys a love of reading and study, and the elements of literary taste, but that stage is not usually reached in a primary school in this country.

Chap. vii. 4.
Chap. vi. 5.

Method. 1st Stage. (General principles.)

2. In the teaching of reading, as in that of all other subjects, the teacher must build upon the

Chap. iv. 4.

knowledge which the boys already possess. Every boy when he comes to school knows a number of common words by sound; it is the duty of the teacher to show him how to recognise those words by sight. The first difficulty, then, which a boy encounters when learning to read is that of interpreting the written words which he sees into the spoken words which he has heard. The only way in which a teacher can assure himself that the boy correctly interprets the written signs is by making him look at them and then say them out loud. This is the origin of the oral reading lesson.

Chap. iv. 3. The next important principle, which we have said that a teacher must follow in his teaching, is to make his lessons interesting. We have also seen that the younger the child the more immediate are his interests. The only way to make a child interested in the reading lesson is to let him read something which is intelligible to him and of which he can see the meaning.

Defects of alphabetic method. 3. It is clear that if the teacher follows these principles of making his lesson interesting and intelligible, he cannot possibly begin his teaching of reading by teaching the alphabet. The alphabet is not connected with anything which a little boy knows before, for he knows his words as whole sounds, and not as built up of letters and syllables. Nor does he feel any interest in learning to pronounce and to recognise by sight single letters, the use or purpose of which is still very remote to him. This fact has long been recognised in western countries, and no trained teacher there

now begins the teaching of reading by the alphabet; indeed, in Germany the 'alphabetic' method of teaching reading is now prohibited by law. Unfortunately, in India this bad custom still lingers. It is a common sight to see little boys after six or eight months in school still toilsomely struggling with the alphabet, a dull series of meaningless sounds. In teaching Urdu reading this is a particularly unintelligent method to follow, for the final forms of the letters, as they appear in the alphabet, are very little like the initial and medial forms of them, which are far more frequently found in words. Moreover, the alphabet, as in other languages, arranges the letters in an arbitrary sequence, without any reference to their frequency in use, so that a boy has to learn to read several very uncommon letters before he comes to those most commonly in use.

The proper method.

4. The teacher should begin by teaching the boys to read simple words of which they already know the sound and meaning. It is best that these should be grouped into sentences in order to add to the interest. The sentences should contain the same words in different combinations, *e.g.* Chap. iv. 2.

Is this a rat?	No, it is a cat.
This cat is fat.	Why is the cat fat?
Where is the rat?	It is in the cat.

(You will note that sentences such as the above will be more interesting if illustrated by pictures; and all good reading-sheets and books are now illustrated with pictures.) Chap. viii. 8.

The boys should be taught not only to read the sentences, but to recognise the individual words that occur in them; and should be practised in picking out the same word wherever it occurs in different sentences.

When a boy has learnt to read a number of groups of sentences, such as the above, he will be able to recognise by sight a number of the words which he previously knew by sound. It is not at all necessary that the words should all be of one syllable, or very short: we recognise a word, such as 'beautiful,' which we know well by meaning and sound much more quickly than a word like 'awry,' of which we may never have heard the meaning or sound before. But it will be easier for the further teaching of reading not to introduce long words, unless they are very common indeed.

Chap. xi. 1.

Introduction to letters.

5. Now, it would clearly be a very long task for a boy to learn all the words in the language by sight, and he would find a still greater difficulty in trying to write and spell them. It is here that the value of letters comes into use in the study of reading. Men spoke for thousands of years before they discovered writing. When they first began to write, they used a separate sign for each word, and this is still the case with some of the older languages, such as Chinese. But modern systems of writing, such as those current in India, split up the words into sounds, and given signs or letters for each sound. By this means, when a man knows the sound of each

letter, he is able to build up from the sounds of the letters in it the sound of a word, which he has never seen before, and perhaps has never even heard before. So it is necessary for a boy to learn the sounds of the letters in order to be able to read new words, and also to distinguish quickly between words which look nearly alike.

After a boy has been learning to read words by sight for a short time, in the manner described in paragraph 4, he will discover that words which sound nearly alike are written nearly alike; indeed, he will often mistake the one for the other in reading. This is clearly the point at which to introduce the teaching of letters, because the boy has begun to feel the need of them. So, when the class has reached the stage when they can read at sight a number of common words (say, fifty to a hundred), and have begun to realise that similar spoken sounds have similar written signs, the teacher will begin to analyse the words into letters. Chap. iv. 2.

If we take the sentences in paragraph 4 as an example, you will notice that they contain several words ending in the syllable 'at.' In this case the teacher would naturally show that the sound 'at' is represented by the letters 'a' and 't,' and give the sounds and names of those letters.

So also the other sentences which a child learns to read should be grouped so as to contain words of similar sound, which should be analysed into the letters which compose them when the time comes.

The defects of individual teaching. Method of class teaching from the reading-sheet and blackboard.

6. It is usual for teachers to set each little boy to reading a primer by himself as soon as he comes to school. The teacher then walks round the class at intervals, and points out a letter or two to each child in turn. Let us suppose there are fifteen boys in the class and the lesson is thirty minutes long. By this method each child will only get two minutes' attention and teaching from the master: for the rest of the lesson he will sit idle, for little boys cannot teach themselves as older boys can do. This system has only to be described for you to see that it cannot be the right one. The solution you will also see must be to teach all the children together, just as a senior class is always taught. Now, if each little boy is supposed to follow in his own book the words which are being read out loud by the teacher or by another boy, he will often lose the place and be looking at one word while another word is being sounded. Every time that he does so he will get a wrong picture of the word being read. Another very strong argument against the use of small reading-books by beginners is the fact that this use is a common cause of near-sightedness. All little children are by nature longsighted and see objects which are some feet away from them better than those which are quite near. The proper way is for all the boys to read from some one place, which they can all see while the teacher points to the word to be read. This place is clearly the reading-sheet or blackboard. Sometimes the teacher will read the

Chap. xvii. 9-10.

sentence first from the reading-sheet, and the class will then read it while the teacher points to each word; sometimes the teacher will call on one boy after another to read a sentence or word; and sometimes he will ask a boy to show him all the places on a reading-sheet where a particular word occurs, or he will ask different boys to read words to which he points. By these and other similar exercises the whole class is kept busy and interested, and no boy is left to idle. There is another difficulty in employing this method, which is generally given as an excuse for individual teaching, and that is that boys join the lowest class at different periods in the school year. This difficulty will be considered in Chapter XVII.

Summary of teaching in first stage.

7. Let us summarise the rules of method for the first stage of reading:

(i.) Teach reading from the reading-sheet and from the blackboard.

(ii.) Begin by teaching the boys to read short sentences containing simple words, which they know, grouped to some extent according to their sounds.

(iii.) When they can recognise some fifty to a hundred words, show them how the sounds of the words can be split up into the sounds of the letters.

(iv.) Teach them to recognise the sounds of the letters and their names; not keeping to the fixed order of the alphabet, but taking first those letters, and groups of letters, which are most commonly found.

(v.) Be careful of pronunciation. People who cannot read or write, whether children or grown-up, are apt to pronounce their words incorrectly; indeed, this is how different dialects have arisen in India. But there is only one correct way of pronouncing a written language, and the teacher should insist on a boy pronouncing it in that way from the first moment the boy comes to school.

Second stage. (General rules.)

8. At the end of the first stage or primer the boys have learnt to recognise by sight many of the words which they knew before by sound only; and they have also learnt how to discover the sound of a word which they have not read before by combining the sounds of the letters which it contains. The time has now come (i.) to introduce new words, of which the children have not hitherto known the meaning, (ii.) to pay attention to the first aim of the reading lesson, namely, the understanding of the subject of the written matter.

Chap vii. 3.

The teaching of new words.

The importance of words as steps in knowledge has been pointed out. All good series of reading-books gradually introduce new and useful words. The teacher must be on the lookout for those which the children are not likely to know, and be prepared with clear explanations of them.

How we read by recognising the words at sight.

9. The aim of the teacher should be to teach his pupils to recognise the new words by sight, as wholes, as soon as possible. A man who can

Application of this fact to the teaching of reading.

read does not analyse words into the letters of which they are composed as he reads them, but recognises them at a glance: and the faster he can recognise words at a glance the better he can read, and the more attention can he devote to the sense of the passage he is reading. You who are reading this do not even think of the sentences as composed of letters and words at all; you think only of the sense, just as, when a man says something to you, you do not think of the words which he uses, but only of the sense of what he says. There is a foolish custom, followed by teachers who have not studied their profession, of making their pupils spell each word before reading it. We have seen in the first stage what the value of letters in reading is; namely, that from their sounds a boy can build up the sound of a word which he has not before seen written. And this is just as true of men as of boys. If you yourself come across a new word in science, such as 'eugenics,' you will be able to pronounce it correctly by combining the sounds of the letters of which it is composed. But once you have done so, and learnt the meaning of it, you will recognise the word afterwards at a glance. And this you will be able to do, no matter how long the word may be. You can recognise the word 'extraordinary' just as quickly as the word 'mien,' because the former word is familiar to you, although it has three times as many letters and five times as many syllables. Just so a boy can recognise a word which he has learned to read as

Chap. xi. 1.

Chap. xii. 8.

p. 5.

quickly as he can recognise a single letter. If a boy comes across a word which is new to him, let him think of the sounds of the letters in it to himself, and then let him try to pronounce it; if he pronounces it wrong, write the word on the blackboard, where all can see it clearly, and pronounce it for him, emphasising the letter which he omitted or mispronounced. But do not let him name the letters aloud, and then pronounce it. The names of the letters are very different from their sounds; and in Urdu the picture suggested by the name of a letter is that of the letter in its final form. For example, if a boy is trying to read مٹر, and is made to say *mim, te, re*, the picture suggested to him will be ـم ـت ـر; while the sounds he is uttering are not in the least like the sound of مٹر.

Intelligence in subject at start now begins to be of importance.

10. The teacher must in this stage be careful that the difficulty which the boys still feel in naming correctly the written words which they see does not prevent them from following the sense of what they are reading. How far they are interested in it will depend chiefly on the quality of the reading-book. If a boy reads straight on without paying any attention to stops, you may be sure he is not taking much interest in what he is reading. It is quite possible for a boy to read a whole page fluently without having understood at all what he has been reading about. The teacher must ask the class during the lesson, and more especially at the close of it, questions to see if they have understood not only the new

words in it, but the general sense of the passage they have read; and he must try and awaken their interest in it. If it is a well-written book and well illustrated, the teacher should find little difficulty in doing this.

Third stage.

11. When the boys have reached this stage they will not have much difficulty in reading words at sight, or even in giving the correct sounds to words which they have never seen or heard before. The teacher must, of course, continue to see that these new words are correctly pronounced and understood; but he will now be able to devote more attention to the proper appreciation of the subject-matter.

A good style of reading now to be developed.

12. We have seen that in the second stage the boys should be taught to make proper pauses at stops. In this stage the boys must further learn how to show by the style in which they read that they are understanding and appreciating what they are reading. This is the art of reading aloud. In the first place, the boys should read in a natural tone, such as they ordinarily use in speaking, not in a loud, unpleasant voice. Caesar, a great Roman who lived two thousand years ago, is reported to have said when visiting a school: 'If you are singing, you sing very badly; if you are reading, why do you sing?' What Caesar said two thousand years ago might often be said in our schools to-day. There are pauses in every sentence other than those which are marked by stops, and we make these pauses in speaking. Boys should be taught to make these

p. 9.

Phrasing.

pauses in reading. Take, for instance, the sentence given above:

What Caesar said / two thousand years ago / might often be said / in our schools / to-day. You will see that when speaking this sentence there are four natural pauses before the full stop. A boy should learn when reading to group his words in the same way, with a very slight pause between each group. This pause should not be exaggerated. A slight emphasis should also be laid on the important words (in the above sentence, *Caesar*, *often*, *our*), and the voice should not drop at the end of the sentence. **Emphasis.**

In this way the class will learn to read in a natural, pleasant tone; and from their very manner of reading the teacher will be able to tell whether they understand and are interested in the subject they are reading.

Chap. IV. 3. 13. In this stage the use of the reading lesson for instruction in grammar and oral composition commences. The only value of grammar is as an aid to correct composition, and more grammar should not be taught than is necessary to help the boys in the very simple oral and written composition that is required in a primary school. Grammar should begin with the sentence, as that is the unit of composition. The first exercise should be for the boys to pick out in a sentence which they have read the subject (including all the epithets and extensions of it) and the predicate, which consists of all that is said about the subject. For instance, the following sentence: **Grammar and oral composition.**

'The large animal, which you see in the picture, has horns on its head.' What is the sentence about? 'The large animal which you see in the picture.' This is the subject. The rest of the sentence is the predicate. The teacher will then show how, in the simplest of sentences, the subject consists of a noun, and the predicate of a verb, or a verb and noun, *e.g.* Karim *sleeps*; cats *eat mice*. The boys will then learn to pick out nouns and verbs from their reader. Bearing in mind that grammar is to be used for composition, the teacher will give subjects and the boys will give suitable predicates, or *vice versa*. He will, in fact, show them how to apply the knowledge they have learnt in making simple sentences.

Fourth stage. Silent reading of greatest importance.

14. In the top class of a primary school the work of the teacher will be to polish the children in the art of reading aloud, and to practise them in the kind of reading which will be of most use in life, namely, silent reading. Reading aloud is a pleasant art, but most of the reading that any man does in life, whether in study, in business, or for pleasure, is done by himself in silence. The practice of this kind of reading is generally omitted in a primary school, but its importance is very great. The teacher should once or twice every week give the class a period of about twenty minutes to read to themselves, and should then question them to see how much they have been able to read in the time, and whether they have understood all that they have read. He should pay special attention to those pupils who

Method of teaching silent reading.

have read slowly, helping them with an oral lesson the next time that the other boys are reading silently, as it is probable that they have not yet conquered the difficulty of recognising words easily at sight. It makes a very great difference to a boy in his studies if he can read rapidly to himself while remembering the sense of what he reads. On the other hand, the teacher will check those boys who have read so fast that they have not retained the sense of what they were reading, and will show them the uselessness of such reading.

Chap. x. 13.

15. In this stage the children will be beginning written composition, but that is no reason why oral composition should be discontinued; on the contrary, it forms the most valuable aid for written composition. The most useful exercises will be practice in extending the subject and predicate, and in combining two simple sentences into one compound sentence. For example, the sentence given in paragraph 3 in its simplest form, becomes 'The animal has horns,' and children would be shown how the extensions, 'which you see in the picture' and 'on its head,' make the meaning clearer. The earliest sentences written by children suffer from a lack of such extensions, and are often far from clear, owing to their terseness. Children should be shown how the proper use of extensions, adjectives and adverbs, improve the sense. Incidentally, they will learn the names of words used for this purpose, *i.e.* adjectives, adverbs, conjunctions, etc.; but technical

Grammar and oral composition

names for different subordinate clauses should be avoided. Children also are inclined to form all their statements in simple sentences, frequently pieced together by 'and.' For instance, in the case of the sentence just quoted, a little child would be inclined to say 'I see a large animal in the picture,' 'It has horns on its head.' Similar pairs of sentences should be made by the teacher by decomposing compound sentences in the reader, and the boys should be shown how to combine them. These exercises should, of course, be all done with the aid of the blackboard. A little practice of this kind, given in the reading lesson, makes a very great improvement in the form of the boys' sentences in written composition.

Chap x. 14.

CHAPTER X.

THE TEACHING OF WRITING.

Chap. vii. 5.

1. We learn to write in order to be able to communicate with others by a second means other than speech. The teaching of writing falls naturally into two divisions (i.) teaching boys how to represent spoken words on paper. In this spelling is included; but as spelling is an important part of the work of a primary school, it will be dealt with in a separate chapter; (ii.) teaching boys how to express their thoughts on paper correctly and grammatically. This is usually known as written composition, and in reality follows closely after instruction in oral composition. But just as the reading lesson, after the initial difficulties of recognising words from written signs is overcome, becomes a lesson in the art of study and in literature, so when boys have learnt how to write in a good hand the writing lesson becomes a lesson in composition.

Aim of the teaching of writing.

Chap. ix. 1.

2. The first lessons in writing in a primary school are generally very little more intelligent and interesting than the first lessons in reading. They are always a little more interesting; for

Method. First stage. Defects of ordinary method.

Chap. ix. 6.

while a boy, who has sat staring at an alphabet primer for half an hour, has nothing to show for his patience, a boy given ink, pen, and writing-board can at least feel he is busy doing something. The signs which he makes are probably useless, and frequently meaningless, but he deceives himself, and not infrequently the teacher, into thinking that he is in this way learning something, though he does not find it very interesting.

Writing, like reading, should begin with small words.

3. There is no reason why a boy should not be given an interest in writing, just as he can be given one in reading. Beginners are generally set to write all the letters of the alphabet in their final form to commence with. Now, the ability to write all the letters in their final form is of much less importance than the ability to write them in the forms in which they appear much oftener, namely, the initial and medial forms. We have also said that reading and writing are closely related. From these facts we conclude that a beginner should first be set to writing simple words. These words must be quite short at first, and should be arranged in groups to illustrate the writing of special letters. In Urdu, for instance, sentences such as یہ لے لو, مت رو — کون ہے would illustrate the letter و. The words ہے and یہ, besides being the commonest in the language, are very easy to write, much easier in fact than غ or ض. A boy who is writing little words and sentences, such as the above, understands what he is doing and is

Chap. vii. 12.

Chap. iv. 8.

interested in it. He feels that he is really learning to write something useful.

The commencement of letters.

4. The next stage, just as in reading, will be to break the words up into their component letters. A good method of doing this is to suggest to a child that he should write his own name. He is sure to be eager to do this. You will then show him how difficult this is to do in the case of a long name, and how the name can be broken up into letters. He now feels the need of learning to write letters separately, and has a purpose for doing so. You have thus got the interest of the children on your side, and the progress made will be twice as rapid as it would have been under the old uninteresting and unintelligent method.

Chap. ix. 5.

Writing must be *taught*.

5. We have seen what the material of the first lessons should be, let us look a moment at the method. If a man who proposed to teach cart-building was to place a model cart and the wood and tools in front of his pupils, and then leave them to build it as best they could, you would call him no sort of a teacher at all, and his pupils would have a right to complain. And yet this is a method of 'teaching' writing commonly adopted in primary schools: the poor little boys are given copy-slips and writing materials, and then left to themselves to puzzle out how the letters should be formed. Clearly in the first lessons in writing the children's power of imitation should be used.

Chap. iii. 8.

Copies to be set on blackboard.

6. All the copies should be set by the teacher himself on the blackboard in front of the class.

He should stand well to the left of what he is writing, so that they can all see *how* he is writing the letters. If he is not a good writer by nature, he should practise this, but he may be very sure that he cannot teach little children to write better than he writes himself by giving them faultless copy-slips to copy from. Copy-slips are useful aids to the teacher, but *not* for use with beginners.

Importance of the correct formation of the letters.

The careful teaching of writing in the earliest stage is very important, in order that the children may acquire the habit of forming their letters correctly. Beautiful results are sometimes produced by children who have written their letters partly from left to right, and partly from right to left, and have touched up their work afterwards. These results are entirely valueless; they are pictures drawn in ink, not written letters. From the beginning a child should be allowed to write his letters only in the proper manner, just as he will write them all his life, and without any retouching. The habit of forming a letter in the wrong way, or of lifting the pen in the middle of a joined group of letters, when once formed, is very hard to break.

For this reason the copies set should be carefully graduated both in difficulty and length, so that a child may take in each whole word or group of letters in one good look at the blackboard, and then be able to write it without lifting his eyes or pen from the writing-board. Words in which four or five letters are joined together are not suitable for the 1st class, because a boy

in that stage cannot carry a picture of such a word in his head.

Writing must not be unnecessarily large.

7. It used to be customary to make little children write very large letters, and this custom unfortunately lingers still in the country. In order to ensure that they write their letters clearly, and in order to prevent them from developing a small hand, it is better that beginners should write a somewhat larger hand than that which they will ultimately adopt. But there is no good reason for teaching them to write letters of a huge size, and very little consideration will show that this is unreasonable and unnatural.

Grown-up people with large hands and arms find it very hard to write letters over half an inch in height neatly, much more so little children with their little hands and arms. For beginners an average height of a quarter of an inch is ample.

Need and use of guiding lines.

8. To aid the children in keeping the letters of an even height, lines should be drawn on the writing boards. The neglect of the *teaching* of writing is well illustrated by the fact that the children are often allowed or required to draw these lines themselves. Needless to say the irregular lines so drawn, if the children attempt to keep between them at all, are more of a hindrance than a help. The lines should be drawn by the teacher. As a great deal of time would be wasted daily if the teacher had to draw the lines afresh before each writing lesson, he

should draw them once for all either with some indelible substance or by light scratches with a penknife. Lines so drawn will not interfere with the movement of the pen.

Second stage. Copy-slips and transcription.

9. After children have learnt how the letters are formed by watching the teacher write them on the blackboard, and have acquired the habit of forming them correctly, it will be possible for the teacher to economise time by the use of copy-slips and transcription. The value of the latter exercise in teaching spelling will be shown in the next chapter; but in India, where the printed script of the reading-books is practically identical with the written script, transcription is also a useful aid to the teaching of writing.

Chap. xi. 2.

The class must be kept together.

10. The class must be kept together. The teacher must guard against the tendency of the better writers to try to write too fast, and to develop an individual hand too early. Common faults should be illustrated on the blackboard, and the teacher should show the class how to avoid them.

Neatness and clearness are particularly important in this stage.

Third stage. Good writing must be required in all written work.

11. The children will now be able to write copies fairly easily, and they will be beginning to use writing in connection with their other studies. The teacher must therefore remember that it is not his object to give the children the power to write well on occasion, but to implant in them the habit of writing well on *all* occasions. Too often boys who write excellent copies during a

writing lesson are allowed to develop a careless and almost illegible style in their other written work. This habit is still further encouraged by the system of allowing the first exercises to be done roughly, and then a fair copy to be made for record purposes or to show an inspecting officer. In after life the boys will have no time or inclination to make fair copies of what they write. The writing which a boy does when he leaves school will be in the style of his exercise books, and not that of his fair copies; the former will become his current hand. It is easy for a teacher to insist on a good standard of writing in his class, even when the written matter is only an arithmetic problem dictated. But if he ever permits his pupils to acquire the habit while at school of writing carelessly, they will never cure themselves of it.

Chap. ix. 14.

12. It is clear that rapidity in writing is now of importance. Boys should in this stage be allowed to develop their natural individual handwriting, in order that they may write fast; but the teacher must insist that it is a good, clear handwriting, and not too small.

Rapidity.

13. By the time the boys reach the top class of a primary school they will have mastered the technical difficulties of writing. Just as in the case of reading, the subject-matter is now of importance; *i.e.* the manner in which they use writing to express their thoughts. This is often classified separately as composition; but apart from the fact that it is a mistake to multiply the

Fourth stage. Written composition.

names for school subjects, it can be properly treated of here, because the time formerly occupied in teaching writing will now be occupied partly in dictation, which is dealt with in the next chapter, and partly in written composition.

Letter-writing.

14. The written composition in a primary school usually, and quite correctly, takes the form of letter-writing. This is not only the most useful, but the easiest form of composition. In it the boys express their own thoughts in their own language to someone whom they know. The matter at first is more important than the form. Boys who can talk freely often find themselves at a loss for anything to say when they sit down to write a letter. It is therefore a good plan to require them to write down first on their slates all that they can think of that will be suitable to put in the letter, and then to write the letter from these notes. If the letter is always written on a certain day in the week, the teacher should one week tell the children the subject of the next week's letter that they may, during the week, think of items to include in it. Often the teacher will simply say: 'Next week you will write a letter to your father, telling him all that happened during the week.' The great object in this early stage of composition is to cultivate in the boys the ability to express themselves freely in writing. Since letters should express the individual thoughts of the writers, it is not wise to adopt the method, so suitable for essays, of composing a model composition on the blackboard,

with the help of the whole class. For the same reason each letter should be corrected with the child who wrote it by the teacher. The teacher will point out how much of interest the child has omitted, for the letters of beginners are always very short, and how the sentences might have been better composed. Faults which are found in a number of the letters should be explained to the whole class, and illustrated on the blackboard. The oral composition which has been practised in connection with the reading lesson will here be of great assistance.

Chap. xii. 30.

CHAPTER XI.

THE TEACHING OF SPELLING.

Why we learn to spell. Spelling a matter of eye rather than of ear.

1. We learn to spell in order to be able to write correctly. Spelling also helps us in reading; but, since boys often make numerous mistakes in spelling a piece dictated to them, which they have just read fluently, it is evident that the connection between reading and spelling is not so close as is generally thought. In fact, spelling is chiefly a matter of the eye, and not of the ear. In some languages this is more the case than in others. In English the sound of the word is very little help towards the spelling, since the same sound is represented in writing by many different groups of letters. In Urdu the ear is of more use, since the sounds of the words resemble much more closely the sounds of the letters of which they are composed; but even here we find different letters with almost identical sounds, the most frequent source of error in spelling. We conclude, then, that the simplest and most effective way to learn spelling is through the eye, by looking at a written word and then writing it.

Chap. x. 4-8.

Chap. viii. 8

Where oral spelling is used in connection with

the reading lesson it is a device to save time, often a necessary device in primary schools; but it should never be adopted as the principal way of teaching spelling. Remember that before a boy can spell a word orally he must picture the word in his mind as a written word.

Chap. x. 9.

2. The teaching of spelling will naturally begin with transcription. Before setting the class to transcription, the teacher should draw attention to those few words which may have a difficult or unusual spelling. After the transcription the hardest words should be dictated to them to see if they have transcribed carefully. Spelling mistakes should always be copied out several times by the boys who made them, in order that the correct form of the word may be impressed on their eyes.

Transcription.

3. In the higher stages spelling will be taught by means of dictation. There are two kinds of dictation lessons, the one which is a test of the pupils' ability to spell, and the other which is an instruction lesson in spelling. The latter should of course be the usual form of lesson, the former should only be practised about once a month.

Dictation lessons of two kinds.

4. In the spelling lesson the dictation should always be of passages previously read or transcribed, because spelling is not a matter of guess-work, but of observation. Nothing is taught by requiring boys to spell words which they have never seen. The following is a typical example of the method to follow:

Method of teaching spelling through dictation.

The teacher will first read a passage over with the boys from their reading-books, and will draw

special attention to words of difficult spelling, writing them up on the blackboard, so that the correct form may be impressed on their sight. Chap. viii. 8. The boys will then close their books and take up their writing materials, while the teacher turns the blackboard round. The teacher will then dictate the piece slowly, making suitable pauses. He should never repeat a word or clause while dictating. This mistaken custom, which is very common, only confuses the attentive scholars, who have written the clause correctly the first time, and encourages the lazy ones to inattention. If the boys are all attending properly, and the teacher is not dictating too fast, there is no reason left for this repetition.

It is a good plan for the teacher to require the boys to fix their eyes on him as soon as they have finished writing each clause; he can thus easily tell when the whole class is ready to proceed to the next clause.

If the class is small, it is by far the best plan for the teacher to correct each pupil's dictation separately with the boy who wrote it; but this will not often be possible. The device of using the pupils to correct each other's work must usually be adopted. Each boy must exchange his slate with that of another who is not sitting near to him; reading-books will be opened at the passage dictated, and the teacher will read it through while the pupils correct mistakes from the book. The dictations will then be returned to their owners, the class will stand up, while the

teacher walks round and inspects the work. If he finds any common mistake, he should write the word on the blackboard and impress the appearance of it on the pupils. Pupils will then write out their mistakes several times.

Method of testing spelling through dictation.

5. In dictation lessons given as a test the teacher should select a passage which the boys have read or transcribed some time before. The boys will not of course look at it, but will listen while he reads it through in a natural voice in order that they may recognise the sense of the passage. If they do not follow the sense of a piece of dictation, they are liable to confuse one word with another of similar sound; if they understand the sense, they will know that only one of the two similar words will give the proper meaning to the passage. In other respects the lesson will follow the lines of the instruction lesson described above.

Dictation of proper names.

6. The teacher should not neglect to dictate occasionally the names of places which occur in the geography lessons, and such other names as may occur in their other school work, *e.g.* in nature study, a knowledge of the spelling of which is important.

CHAPTER XII.

THE TEACHING OF ARITHMETIC.

Importance of method in teaching arithmetic.

1. Few subjects of the Primary school curriculum are harder to teach well than arithmetic. Yet in no subject is it more important that the teacher should use intelligent methods. It is comparatively easy for him to obtain from his pupils neat exercise books filled with accurately-worked examples, but too often these are the result of a mechanical application of set rules learnt by rote. Unless the children understand something of the principles and practical usefulness of these rules, their intelligence is not being trained nor will they be able to apply their knowledge in after life. Chap. vi. 1, 3.

2. The amount of arithmetical knowledge which children possess when they come to school, the foundation on which the teacher must build, varies considerably; but it is probable that every child of six is able to count up to three, and to distinguish between one thing, two things, and three things. The number, however, will have no meaning for him apart from the objects counted.

The first aim of the teacher.

The first object of the teacher's instruction must be to show that the relationships between numbers are permanent, whatever the objects are that they qualify; that is to say, that $3 - 1 = 2$, whether it be one cow taken from three cows, one boy separated from three boys, one pencil lost out of three pencils.

The analysis of number.

3. The teacher will therefore begin with groups of objects of the same kind, and analyse the numbers of which they are composed. He should take care not to begin with one object and add another, saying, 'one, two,' because the child will then think of the first object as called 'one,' and the second as called 'two.' He should rather hold up one pen, and say, 'This is one pen,' and the other, and say, 'This is one pen'; then putting the two together, 'Two pens.' Then, taking away first one of the pens, and then the other, show that, by taking one pen from two pens, one is left. He should do the same with writing boards, ink pots, books, strokes on the board, etc., until the boys thoroughly understand that one and one make two, and one from two leaves one, whatever the objects are which are being counted. In the same way, he should show that three is either $1+1+1$, or $2+1$, or $1+2$, and that $3-2=1$, and $3-1=2$, using concrete objects of various kinds. The ball-frame is a useful instrument in such lessons, and should be constantly used; but the balls on the ball-frame should not be the only objects counted, or the children will acquire the habit of thinking that numbers only apply to a ball-frame, and not to all objects that may be counted. It is a good plan to use the boys themselves as units, making, for instance, five boys stand up, and then two sit down, and seeing how many are left. Fingers may also be freely used with beginners, *e.g.* 'Show six fingers,' 'Take away three,' etc.

Notation.

The class should learn to write each number as they learn it, showing by dots on the board and their slates that they know what it means, *e.g.* ⁘ = 5 dots. When the children have learnt the analysis of a number, they should have constant exercises on it, *e.g.* 'If I had three cows, and one died, how many would I have left?' 'I gave two annas to Abdul and one to Sultan, how many annas did I give away?'

This analysis of numbers should proceed till ten is reached, addition and subtraction going on at the same time.

The teaching of decimal notation.

4. When ten is reached the teacher must make bundles of ten sticks, pens, etc., and show the class how, as soon as we reach ten, we count it as one bundle, and keep the extra units separate. He should explain that we count by tens, because we have ten fingers, and that twelve means one lot of ten and two ones, twenty-five = two bundles of ten and five ones, fifty-three means five bundles of ten and three over. The writing of the figures on the board helps the children soon to grasp this idea. At the same time the teacher must be careful to continue his analysis of numbers, splitting up the bundles, and showing the class that fifteen does not merely mean ten and five, but is also composed of nine and six, eight and seven, etc. If the analysis of the numbers 1 to 9 has been properly carried out, the class has very little difficulty in picking up this idea.

p. 9

p. 16.

Mental drill.

5. Before proceeding beyond twenty, the teacher should give the class very constant drill in addition and subtraction. Sometimes the drill

will be in the numbers only, *e.g.* 7 − 5, 8 − 6, seven from nine, etc.; and sometimes it should be in a concrete form, *e.g.* 'I have seventeen miles to walk, and have walked eleven, how many miles have I still to go?' 'I have ten fingers and ten toes, how many altogether?' It is of great importance that now that the meaning of numbers is understood, the answers to such questions should be immediate, and require no effort of thought at all. Needless to say all aids to thought, such as counting on fingers, should now be strictly forbidden. Most of the mistakes made in arithmetic in a primary school are due to insufficient drill in mental addition and subtraction.

Chap. v. 4.

Addition and subtraction to be taught together.

You will notice that the teaching of addition and subtraction in these early stages, where the work is oral, has proceeded simultaneously. They are very closely connected, and much time will be saved a child if such a fact as 5 + 4 = 9 suggests to him immediately that 9 − 4 = 5.

Numeration and notation.

The class will then proceed to the numeration and notation of figures up to 100. If they have thoroughly understood the preliminary steps, and the method of writing 10 and 20, this should present no difficulty to them.

The multiplication tables.

6. Before proceeding to written addition and subtraction, it is usual to begin the multiplication tables. Now, the multiplication tables are nothing but a short method of addition, and should be explained to the children as such. The easiest method is for the teacher to take his bundles of ten, and show how one bundle of ten and another bundle of ten = twenty, and another bundle of

Chap. v. 3, 4.

ten = thirty, and another bundle = forty, etc., writing at the same time 10 + 10 + 10, etc., on the blackboard. Having shown how the result is reached in this way by addition, the children will readily understand that, instead of saying ten and ten are twenty, ten and ten and ten are thirty, etc., it is much shorter to say two tens are twenty, three tens are thirty, and so forth. In this way the class will have arrived at the ten times table without any difficult process of reasoning, but at the same time intelligently. The ten times table is the best to begin with, partly because the children have already been accustomed to bundles of ten, partly because it is so easy for children to remember. Having once grasped the idea with this simple table, they will the more readily proceed to the other less simple tables. The teacher must now show how when we want to add up any other number of equal quantities we use the same plan; for instance, one bundle of two is two, two bundles of twos are four, three bundles of twos are six, etc. He will also write on the blackboard 2 + 2 + 2, etc., to make his meaning clear. When the children have learnt the ten, the two, and three times tables in this way, they should have understood the meaning of the multiplication tables, and it should no longer be necessary for the teacher to pursue this lengthy method of instruction. He must, however, show them how the tables are connected, *e.g.* that $2 \times 6 = 6 \times 2$; this he will do by making two bundles of six, and breaking them up into

six bundles of two; a few illustrations of this should suffice to explain the idea to the children.

Chap. v. 4.

7. When the meaning of the multiplication tables has been explained, they should be thoroughly memorised verbally; that is to say, the children should be taught to know at once that twice six is twelve without any exercise of reasoning. These tables, together with the simple mental additions and subtractions which have been already taught, form the basis of all the arithmetic taught in a primary school. When they are once understood, they should not give the mind any future cause for thought, but should be used as tools for solving arithmetical sums; just as the mere recognition of the words by sight in reading should not give the mind any trouble after the first stages, but should be used as a means for understanding the matter read.

The importance of memorising these tables.

Chap. ix. 8.

Besides mental drill in the mere numbers, the teacher will also give practical illustrations of the tables to show their use, *e.g.* 'There are nine boys in a class, and I give them each three annas, how many annas must I give?' 'There are five desks in a class-room, and six boys at each desk, how many boys in the class?' etc.

Mental drill.

8. Before treating of written sums, I must emphasise the fact that in a primary school mental arithmetic is of much more importance than written arithmetic. We have seen that arithmetic is taught (i.) partly for its practical utility, (ii.) partly as a basis for further studies, (iii.) partly that through the methods employed

The primary importance of mental arithmetic.

Chap. vii. 6.

the mind may be trained. Now in the affairs of everyday life it is mental arithmetic that we most constantly employ. Unless we need to keep a record of a sum, we never take pencil or paper to work it out until we have tried to solve it mentally; indeed, writing materials are frequently not available. The man who can calculate quickly in his head the profit or loss involved to himself by any transaction has very much the advantage over a man who can only work out the result laboriously on paper. Again (ii.) the arithmetic learnt in a primary school is the basis of the further mathematics learnt in a secondary school. The more certain and quick we are in these elements, the better equipped we are for this higher work. When a boy is working out a long and difficult sum, every subsidiary calculation, which he cannot reckon in his head, means not only waste of time and paper, but also additional thought and attention diverted from the main sum; just as in reading, a boy who has to study the forms of the words from the letters has his mind diverted from the meaning of the passage he is reading, or as a man playing a musical instrument, if he has to think carefully where to place his fingers, has his mind diverted from the beauty of the piece he is playing. Naturally (iii.) better training to the mind is given by intelligent exercises in mental than in written arithmetic.

Let the teacher then remember that in a primary school written arithmetic is an aid to

mental arithmetic, though the reverse may be the case in a secondary school.

9. Written addition and subtraction will now be commenced. In the first sums set the results will naturally not exceed 100, as this is the limit of the boys' power of numeration. The headings —hundreds, tens, units, or H. T. U.—should at first be written over their respective columns. As the boys have already learnt that when a number exceeds ten only the units are written in the first place, no difficulty should be experienced in teaching them in an addition sum to add the tens which are carried to the tens already shown in the next column.

Second stage. Written addition.

p. 4.

10. Written subtraction is by no means so easy to teach, and several methods of teaching it are followed. When each of the figures to be subtracted is smaller than the one above it on the upper line, little difficulty will be found; the difficulty arises when any number is larger than the one immediately above it. Before teaching a simple method of subtraction the teacher must first explain carefully what the process is; for example, supposing the sum to be $\begin{array}{r} 36 \\ -29 \\ \hline 7 \end{array}$ the teacher must first explain that, since nine cannot be subtracted from six, a ten must be taken from the next figure and added to the six, making it sixteen, from which nine can be subtracted, leaving seven. He will then point out that the three has been reduced to two, so that the remainder of the sum is, two from two = nothing. He should

Written subtraction

explain how *this is justified*, because $36 =$ not *only* $30 + 6$, but also $20 + 16$. *If the children* have been properly drilled in the analysis of p. 4. numbers up to twenty, they will readily understand this analysis of 36.

He will then show them a simple method of subtraction, such as the following: 9 and *what* make sixteen? Write down 7 and carry 1. Three and *what* make three? Nothing. As a matter of fact, this questioning form will only be used for the first few examples. Afterwards the form will be: Nine and *seven* (writing it down) are sixteen; three and *nothing* are three. This method of using the additional form in subtraction is much faster than the usual methods. I will give another example to make it clearer:

$$\begin{array}{r} 38624 \\ 27816 \\ \hline 10808 \end{array}$$

The words used mentally in this sum would be as follows: Six and *eight* are fourteen, two and *nothing* are two, eight and *eight* are sixteen, eight and *nothing* are eight, two and *one* are three. In every case the number in italics is written down as soon as it is said or thought. Whenever the third number in the clause exceeds ten, as fourteen in the first clause given, it shows that a ten has been added, and one must be added to the next number to be deducted.

Numeration and notation. Large numbers to be avoided.

11. The teaching of numeration and notation up to a thousand or a lakh will present no great difficulty. At this point it is necessary to warn

teachers against a common practice, encouraged by some badly written text-books, of setting sums involving crores, or even larger amounts. There is no better training in addition given by such a sum as 378496532 + 48768435 than in two small sums, such as 3784 + 4876 and 96532 + 8435 (the same sum halved), but, whereas the former sum involves quantities which might possibly be used by the Government of India, but certainly by no private individual, the quantities in the latter sums might occur in the life of any individual. Concrete examples should constantly be used, *e.g.* 'There are 18,753 people in such-and-such a place; 9362 are men, how many are women?' 'The Taj Mahal was built in 1632, the present year is 1913; how old is the Taj Mahal?

Mental exercises.

12. The oral practice in addition and subtraction should not be dropped when written sums on these rules are begun; it should, on the contrary, receive constant attention. A good form of drill is to start with a number, say 90, and to go downwards by subtracting a fixed number, say 7, as 90, 83, 76, 69, etc. Each boy should say the next number only (not 7 from 90 is 83, but simply 83; the next boy saying immediately 76, etc., etc.). In the same way the class may start with a low number, and count upwards by adding a fixed number, *e.g.* 12, 19, 26, 33, etc., only the number required being spoken, the process being worked mentally.

Additions and subtractions of larger numbers

should be practised, *e.g.* $33 + 15$, $55 - 17$, and so forth. It should be noted that the mental addition or subtraction of such sums differs from the written, in that the tens should be added first, *e.g.* in $33 + 15$ the process of thought should be $33 + 10 = 43$, $+ 5 = 48$, and in $55 - 17$ the process is $55 - 10 = 45$, $- 7 = 38$.

The value of all these exercises lies in their rapidity; with proper practice the correct numbers should be given almost simultaneously by the class.

Simple multiplication.

13. The teaching of short multiplication, when the tables have been learnt, should present no difficulty; the carrying of the tens being similar to that in addition. When the multiple is ten, the teacher should explain how the units will all become tens, the tens hundreds, etc., so that the multiplication is simply effected by placing a nought to the right of the units figure, thus converting it into tens, the tens to hundreds, etc. He will then show that to multiply by 20, 30, etc., the simplest way is to multiply by 2, 3, or whatever multiple of ten it may be, and to affix a nought in the units place. He will then show how multiplication by 200, 5000, etc., can be similarly effected by affixing the requisite number of noughts and multiplying by the given number of hundreds or thousands.

Long multiplication. (*a*) Correct method.

14. The process so far has been simple, but the class must now proceed to multiply by large complex amounts, *e.g.* 637. The teacher must first explain that to multiply by the different

parts of this number, and to add the results together, has the same result as to multiply by the whole number. He should prove this by one or two examples, of which the children know the answers, *e.g.* $7 \times 8 = 56$ and $(5 \times 8) + (2 \times 8)$ also equals 56. So that, if we have to multiply by 637, all that need be done is to multiply by 600, by 30, and by 7, and to add the results. The class have learnt that to multiply by 600 we put down two noughts and multiply by 6, to multiply by 30 we put down one nought and multiply by 3, and multiplication by 7 is familiar to them, so that the sum 3784×637 appears as follows:

$$
\begin{array}{rl}
3784 & \\
637 & \\
\hline
2270400 = & 600 \text{ times.} \\
113520 = & 30 \quad \text{,,} \\
26488 = & 7 \quad \text{,,} \\
\hline
2410408 = & 637 \text{ times } 3784.
\end{array}
$$

(*b*) Incorrect method.

Most teachers adopt the unintelligent method of teaching children to multiply by the 7 first, then by the 3, moving the answer on a space, and then by the 6, moving the answer on a further space. This method is wrong, because (i.) it does *not* build on the children's previous knowledge; for instance, in the above sum, the children already know how to multiply by 600, by 30, and by 7, and the teacher, following the old system, deliberately neglects to use this knowledge. It is therefore unintelligent, and is indeed generally unintelligible to children; (ii.) owing to

its unintelligibility it leads to frequent mistakes. For instance, when *multiplying by such a number* as 10,050, the children are frequently at a loss to know under which figure to put the results; whereas they would have no difficulty whatever in multiplying first by ten thousand, *i.e.* put down four noughts and multiply by one, and then by fifty, *i.e.* put down one nought and multiply by 5, and by following the latter plan the figures must appear in the right places. (iii.) It does not correspond to the procedure of everyday life, and the practical value of arithmetic must never be lost sight of. If the above multiplication occurred in a business transaction, it would be far more important to know the result of the 10,000 times quickly and correctly than it would be to obtain the result of the 50 times; indeed, in many practical cases, the multiplication by 10,000 would give a sufficiently approximate result, and the multiplication by 50 would be altogether omitted.

In long multiplication, then, begin with the important, *i.e.* the largest number.

Short division.

15. Before teaching the ordinary rules of division, the teacher should show that, just as multiplication is a shortened form of addition, so division is a shortened form of subtraction. He should begin by giving one or two practical examples to show children their need for division, *e.g.* 'If I have 14 annas, and spend 2 annas a day, how long will my money last?' etc. The children would naturally solve this by seeing how

often two can be subtracted from fourteen. With the aid of the blackboard, he should then show them how, by the use of the multiplication table, the same result can be obtained in a much shorter form by division. At first the method of long division should be used, even with simple figures, and the result analysed and added up just as in long multiplication, *e.g.* 3467 ÷ 6 will be:

	Th.	H.	T.	U.
		5	7	7
6)	3	4	6	7
	3	0	0	0
		4	6	0
		4	2	0
			4	7
			4	2
				5

The procedure being 3400 ÷ 6 = 500 and 400 over.
460 ÷ 6 = 70 and 40 over.
47 ÷ 6 = 7 and 5 over

Ans. 577 and 5 over.

Then the short method of division should be taught. This should not present any difficulties. The figures of the answer should always be written above the figures divided as in the above example; this will show their proper value, and prevent the omission of any figure in division.

16. Long division is always a stumbling-block to children, the difficulty being to know how many times the division will go into the given number. There is no simple plan to avoid this

Long division.

difficulty, which is felt by grown-up people equally with children. Constant practice is the only solution.

All the arithmetic done in a primary school consists only of modifications of the above four simple rules, and so it is very important that boys should be thoroughly drilled in these rules. Mental practice in addition, subtraction, multiplication, and division should form part of every arithmetic lesson.

Third stage. Compound addition.

17. The compound rules are naturally interesting to children, especially if the examples given deal with practical calculations which the children can understand. No difficulty should be experienced in teaching compound addition, since the children are already accustomed to carrying on tens from the units column, and will easily apply the same idea to the carrying on of every sum of 12 pies to the annas column, and of 16 annas to the rupees column.

Compound subtraction.

18. These rules are taught only for their practical value, and this fact will introduce a slight modification in the method of subtraction. Supposing the sum to be Rs. 2. 5 as. — 10 as., the ordinary method of procedure would be: 10 as. from 5 will not go, borrow a rupee, and add it to the 5 as., then 10 from 21 leaves 11 annas, 1 rupee from Rs. 2 = Re. 1. Ans. Re. 1. 11 as. But this is not at all what you would do in ordinary life. Supposing you had Rs. 2 and 5 as. in your pocket, and wished to buy a book costing 10 as., you would hand the shopkeeper a rupee.

and receive six annas change, which would leave you with one rupee eleven annas. If you handed the rupee and the 5 as. to the shopkeeper, he would simply hand you the 5 as. back, and then give you the 6 as. change from the rupee; he would also think you a very stupid person. So, in working the above sum, the proper procedure is: 10 as. from 5 as. will not go, borrow a rupee, 10 annas from $16 = 6 + 5 = 11$, one rupee from $2 = 1$. Ans. Re. 1. 11 as. You will see that this is a quicker method of working such a sum, as Rs. 8. 13 as. 9 pies – Rs. 6. 15 as. 10 pies. The working is

R.	a.	p.
8	13	9
6	15	10
1	13	11

ten from twelve two, and nine is *eleven*; fifteen from sixteen one, and twelve is *thirteen*; six from seven *one*. Each subtraction, by this method, is simpler than it would be under the other method.

19. Compound multiplication in the short form is quite easy for the children to understand. In the long form several clumsy methods are usually employed, *e.g.* the multiplication of the pies, annas, and rupees in separate little sums, or the use of multiplication by tens. A much simpler method can be employed if it is remembered that $6 \times 3 = 3 \times 6$; that is to say, instead of multiplying upwards by the large number we can multiply downwards by the smaller number of

Compound multiplication.

pies, annas, etc. One example should make this *method clear:*

Rs. 387. 11 as. 8 pies × 457

Rs. 387. 11 as. 8 pies
457
12) 3656
304 as. ... 8 pies.
5027
16) 5331
333 Rs. ... 3 as.
137100
36560
3199
177192 Ans. Rs. 177192. 3 as. 8 pies.

In this example I multiply downwards: first 8 × 457, which gives the pies, which are reduced to annas, the pies left over being part of the answer; then 11 times 457; the result being added to the annas carried over; these are reduced to rupees, the annas left over forming part of the answer; and finally, 387 × 457, which, added to the rupees carried over, gives the rupees in the answer.

This not only gives a clear sum, in which mistakes can be easily detected, but it is much quicker than the other more clumsy methods.

Compound division.

20. Compound division requires no special comment. In long compound division the results should be written over the quantities to which they refer, *e.g.* the results of dividing Rs. 177,192. 3 as. 8 pies by 457 will appear

Rs.	as.	p.
387	11	8
457) 177192	3	8

(the detailed working is omitted).

Mental exercises.

21. With constant mental practice the boys should be able to answer very quickly sums such as Rs. 2. 7 as. + Rs. 5. 10 as., Rs. 7. 8 as. − Rs. 3. 10 as., Rs. 3. 6 as. × 5, Rs. 6. 8 as. ÷ 4. In all cases remember that the highest quantities should be dealt with first mentally, even though that may not be the order adopted in a written sum; *e.g.* in Rs. 3. 6 as. × 5, the procedure is 3 × 5 = 15 Rs. + (5 × 6 =) 30 as. = Rs. 16. 14 as.

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Application of a half and a quarter.

Chap. vii. 5.

The notion of a half and a quarter which the boys will have already acquired in daily life should be applied to money. They should know what the half or quarter of a rupee, an anna, or any simple sum amounts to.

Measures of length, etc.

22. The written work with other measures (length, weight, etc.) will follow the methods adopted for money sums, and when the tables have been properly memorised will cause no special trouble.

Practical mental work with measures of length, etc.

23. The mental work should be made as practical as possible. It is quite common to find boys working out sums involving feet, yards, furlongs, etc., without having any idea what these terms represent. Now, we by no means always find ourselves provided with rules or measuring tapes when we wish to judge lengths in ordinary life; and it is a very valuable practice for boys to learn to estimate distances at sight. The teacher should begin by asking the boys to estimate the length of a pencil, a slate, the blackboard, a window, etc., and should test their answers by actual measurements with a ruler. The

boys will then estimate the length of the room, its height, distances in the playground, etc., the accuracy of their answers being always tested by the teacher. After practice of this kind, which children naturally find very interesting, a class may become very expert in judging distances and lengths at sight, a power which will stand them in very good stead when they leave school. If scales are available, it is also good to practise the boys in estimating weights (of books, etc.) by hand, checking their results with the scales.

Other mental exercises.

24. Of course other mental exercises in addition, subtraction, etc., similar to those outlined in paragraph 21, will be practised at the same time. Problems involving more than one rule should be constantly introduced both in the written and oral work, such as 'I buy five dozen eggs at 3 as. the dozen, and sell them at 4 as. the dozen, what is my gain?' This class of problem is often classified separately as 'Profit and Loss,' but nothing but an intelligent knowledge of the compound rules is required for their solution.

Fourth stage. Fractions.

25. Some knowledge of fractions will be required of boys before they leave a primary school. Fractions are usually most unintelligently taught, since teachers are apt to lose sight not only of their meaning but of their use. Knowledge of which no use can be made is valueless, and it is a much better exercise for the mind to work out several short intelligible and possible sums than

one long, unintelligible, and impossible one. By an impossible sum I mean such a sum as:

$$\frac{\frac{2}{5}+\frac{1}{3}-\frac{3}{13}}{\frac{4}{7}\times\frac{3}{8}\div\frac{1}{13}} \quad \text{or} \quad \frac{\overline{3+2}}{5-\frac{7}{8}}$$

because it is impossible to conceive any circumstances arising in the life of any ordinary person in which he would be faced by such problems. Let the sums set be short and intelligible.

Explanation and analysis of fractions.

26. The boys will already have some understanding of 'a half' and 'a quarter.' This knowledge should be the basis on which the teacher builds. He will first explain that when anything is divided into two equal parts each of these halves is represented by $\frac{1}{2}$, and so on with the other fractional parts. This explanation must be carefully illustrated by concrete examples, *e.g.* by dividing a line drawn on the blackboard, an orange, a strip of paper. It is best to give the boys strips of paper with which they can themselves follow the operations of the teacher. The teacher should prepare his own devices for the explanation of fractions, and not rely on prepared fractional charts, which seldom convey a clear idea to children. After showing the meaning of a single fraction, the teacher will analyse $\frac{1}{2}$ into $\frac{2}{4}$, $\frac{4}{8}$, etc., in order to prepare the way for addition. A ruler divided into inches, and eighths and other fractions of inches, is a very useful help in such explanations. If this analysis is thoroughly carried out, and the children gather

Addition and subtraction of fractions.

the idea that only fractions with similar denominators can be added, the teaching of the addition and subtraction of fractions should be a comparatively simple matter, as also that of the reduction of fractions to their lowest terms. The children at this stage are older and quicker to grasp an explanation. The great detail required in the explanation of arithmetic in the lower stages should no longer be necessary, but the teacher must be very careful to see that the children *do* understand the meanings of the rules they are learning. Chap iv. 5.

In mental arithmetic, simple sums, such $\frac{1}{2}+\frac{1}{3}$, $\frac{1}{4}-\frac{1}{5}$, should be constantly practised. The simplest rule for the addition of fractions with one for numerator is to add the denominators to form the numerator of the answer, and multiply the denominators to form the denominator of the answer. Other simple rules for mental work can easily be discovered by the teacher.

The application of fractions to whole numbers, treated as units, should be practised. Such questions as $\frac{2}{3}$ of six, $\frac{3}{4}$ of sixteen, should be immediately answerable by the class.

Multiplication of fractions.

27. The multiplication of fractions is one of the easiest rules in arithmetic. It should be carefully explained to the class that the cancelling is done only to save reducing the answer to its lowest terms, *e.g.* $\frac{2}{5}\times\frac{3}{4}=\frac{6}{20}=\frac{3}{10}$ is quite correct, but it saves time and trouble to do the reduction first, as:

$$\frac{\cancel{2}}{5}\times\frac{3}{\cancel{4}}=\frac{3}{10}.$$

Division of fractions.

28. The division of fractions is usually taught quite unintelligently, by simply giving the formula, 'Turn the divisor upside down and multiply.' This, in itself an excellent method of solving the sum, is complete nonsense unless it is explained.

The proper method is to start with the division of a single unit, 1, by a fraction. The teacher will refer to the original explanation of division, namely, that it is a simplified method of finding out how many times one number can be subtracted from another. It is clear, therefore, $\frac{1}{7}$ can be subtracted from 1 seven times; therefore, $1 \div \frac{1}{7} = 7$. If the children keep this notion of division clear in their heads, they will not be puzzled, as they often are, by the fact that when a number is divided by a fraction the result is a larger number than the one divided. The answer tells us how many times the fraction can be subtracted from the number. The teacher will then proceed to the division of larger numbers by fractions; clearly, if $\frac{1}{7}$ will go seven times into one, it will go six times as often into six = 42, etc. Again, if $\frac{1}{7}$ will go seven times into one, $\frac{2}{7}$ will go into 1 only half as often, as it is double as big a number as $\frac{1}{7}$. This may be illustrated by $12 \div 2 = 6$, but $12 \div 4 = 3$, etc.; the children should be able to see this for themselves. Therefore, $1 \div \frac{2}{7}$ goes the half of seven times, or $\frac{7}{2}$ times. A number of illustrations of this point should be given, and the children should be led to discover for themselves that the simplest and

quickest method of obtaining the result of dividing 1 by a fraction is to turn the fraction upside down. This will always give the right answer, *e.g.* Now, if $\frac{2}{7}$ will go into one $\frac{7}{2}$ times, it will go into any fraction of one that fraction of $\frac{7}{2}$ times, it will go into $\frac{3}{5}$ of one, for instance, only $\frac{3}{5}$ as often as it goes into one. Therefore, $\frac{3}{5}$ divided by $\frac{2}{7}$ is $\frac{3}{5}$ of $\frac{7}{2}$. We thus come to the rule that when we wish to find how many times one fraction will go into another, we first find the number of times the fraction will go into 1, and then multiply the result by the fraction which we wish to divide. Now, we can always tell the number of times a fraction will go into 1 by simply turning it upside down, so that all that is left, when this is done, is to multiply by the fraction we wish to divide. Therefore,

$$\frac{3}{5} \div \frac{2}{7} = \frac{3}{5} \times \frac{7}{2} = \frac{21}{10} \text{ or } 2\frac{1}{10}.$$

This is one of the hardest rules to explain to children, and the teacher should proceed step by step in consecutive lessons to make the explanation clear. Once the explanation is clearly understood the rule of procedure is very easy, namely, that to divide one fraction by another, turn the divisor upside down and multiply.

Simple proportion.

29. Simple proportion is most easily explained by means of fractions, and also most easily worked by means of them. For example, compare four annas with a rupee, and you find that 4 as. is $\frac{4}{16}$ or $\frac{1}{4}$ of a rupee, and a rupee is $\frac{16}{4}$ or $\frac{4}{1}$ of

four annas. By the use of similar illustrations in simple numbers, in money, in length, etc., the teacher will show to the children that (i.) two things to be compared must be of the same kind or denomination. (Just as fractions cannot be added or subtracted till they are reduced to a common denominator, so when feet are compared with yards the yards must be reduced to feet for the purpose of the comparison, rupees must be reduced to annas before they are compared with annas, etc.) (ii.) When we wish to find the ratio or proportion of one number to another, we divide it by that number; for instance, in the example given, we compared 4 as. with a rupee by dividing it by a rupee, reduced to sixteen annas. Having thoroughly explained these two principles of proportion to the class, the teacher will proceed to show their use by practical examples of the simplest character, *e.g.* if 5 books cost 10 annas, how many will 2 cost? Obviously they will cost less; therefore, we compare the less number 2 with the greater number 5, and the sum will be $\frac{2}{5} \times 10 = 4$ as. Then harder examples will be given, *e.g.* 'In how many days will 12 men do a piece of work which 5 men can do in six days?' Obviously they will take less time; therefore, we compare the less number 5 with the greater number 12, and the sum will be $\frac{5}{12} \times 6 = \frac{5}{2} = 2\frac{1}{2}$ days.

Simple interest.

If simple interest is taught, the children should be taught to understand why we pay interest, and practical illustrations given. The

teacher will have no difficulty in finding a number of these from his own experience and from those of the children. The working of a simple interest sum will be simply a case of proportion.

Importance of neat and concise working, all of which must be shown.

30. In these last two stages, when the written sums are longer and more complicated, it is very essential that every calculation which a boy finds it necessary to write down should be shown up with the sum when it is submitted for correction. If proper attention has been paid to mental arithmetic, the number of such subsidiary calculations which a boy cannot solve in his head will be proportionately small, but such as they are they should always appear as integral parts of the working of the sum. When sums are worked on paper, permission to make a rough copy first on a slate or scribbling paper should never be given. The excuse sometimes offered for this practice is that it teaches boys to be neat, whereas of course it teaches the exact opposite. When a boy leaves school, he will not have time or inclination to make fair copies; and as in the case of writing his style will be that of his rough school copies. But, besides encouraging untidy habits of writing, this fair copy system also induces careless and slovenly habits of thought. To save himself the trouble of thinking, a boy will often write down little calculations on his rough paper which he could very well solve in his head. As stated at the beginning of this chapter the aim of the teacher should be to ensure that as much of the

Chap. x. 12.

work as possible should be done mentally, so in the later stages particular stress should be laid on clear and concise working. Clear and concise written work is a sign of intelligent and accurate thought.

CHAPTER XIII.

THE TEACHING OF GEOGRAPHY.

Geography must begin with the neighbourhood.

1. Elementary geography deals with the earth in its relationship to man. In order to make it intelligible, the teacher must start with that part of the earth which is known to his pupils, and gradually extend their knowledge to the limits prescribed for teaching in an elementary school. Chap iv. 4.

Method. Stage I. Cardinal points. Definitions.

2. The teacher should begin by giving the names of the north, south, east, and west, and by showing his pupils the simple way to find them by means of the sun. From this beginning, he will proceed to explain the more elementary terms used in geography, such as mountain, river, island, using as illustrations the physical features of the neighbourhood. Those of which no natural examples are to be found in the vicinity he should illustrate by models made in the compound, *e.g.* an island, a peninsula; for this purpose he will only require a little sand or clay and water. More abstruse terms, such as volcano, he may well omit for the present. The ability to repeat a geographical definition by no means implies a proper understanding of the term which Chap. vii. 3.

it defines. But, fortunately, geographical definitions are so simple that, with the aid of these practical illustrations, either from nature or models, a teacher should have no difficulty in making their meaning clear. A proper understanding of geographical terms is a necessary preliminary to the study of geography.

3. Simultaneously with the explanation of these terms, the teacher should explain the meaning of a map. First let the boys draw a plan of the schoolroom to measurement, then one of the schoolhouse and compound. Stepping is a useful form of measurement to employ, because after the school and compound have been drawn it is easy for the boys to draw a plan of a larger area, such as a few fields, without any difficulty arising from the use of measuring instruments. Of course for the actual drawing of the maps and plans rulers should be employed, or pieces of paper marked with inches, quarter inches, etc. One such inch or quarter inch would be used to represent the length of a step.

The meaning and use of a map.

The first real difficulty which the teacher will encounter is that of explaining how maps of the same size may represent areas of very different sizes. He should, therefore, make the children draw at least two maps of the schoolroom of different sizes, representing the step in one map by an inch or half inch, in the other by a quarter inch. By comparing the maps he will show that the larger map allows them to put in more details, but the smaller map, while giving less

Scale.

room for details, gives room for them to draw larger areas. To impress this idea, he would do well to show the class maps of the District, the Province, and India, and to point out how the children's village is marked large on the district map, small on the provincial map, while on the map of India there is no room for it to be marked at all. He will then explain that the unit of measurement in a map is a mile, which is represented by different measurements, according as the map is of a large or small area. He must further explain carefully how the geographical terms which the class has learnt are represented in maps, *e.g.* mountains by thick lines, rivers by wavy lines, which grow wider as the river approaches its mouth.

Second stage. The district.

4. In the next stage the boys will begin with a study of the District. Besides studying the physical features, revenue divisions, and chief towns, the boys should learn the chief industries and occupations followed in the district, *e.g.* where leather is worked, where corn is grown, where salt is mined. Boys cannot discover these facts for themselves; the teacher must tell them; but they should be able to suggest reasons from the nature of the country why different occupations are followed in different places. Now, some of the places in the District will not be remarkable for any particular fact: in what way is the teacher to help the class to remember them intelligently? By connecting these places with the boy's home through a sense of direction.

The importance of training the sense of direction.

5. The most practical use we make of geography every day of our lives is in finding our way to places to which we wish to go. If the place is very familiar to us, as his schoolhouse to the schoolboy, we find our way there without effort of thought, just as we read without noticing the letters, or say '12' when twice six is asked us. Our difficulties arise when we have to find our way to a place to which we have never been before. We are then obliged to rely (i.) on our knowledge of the road or direction which we obtain from others or a map; and (ii.) on our ability to use this knowledge, *i.e.* our sense of direction. Everyone has experienced, probably more than once in his life, the difficulty of finding his way to some place, whether in town or country, his only guide to which has been either a slight general idea of the locality gained from experience or from maps, or the directions given him by others. Indeed, there are many people who not only have much difficulty in finding their way under such circumstances, but who cannot accurately direct a stranger to a place, even though they are themselves quite familiar with the way to it. These difficulties are chiefly due to a defective, because untrained, sense of direction. But this sense can be rendered very acute by training and practice, as we can see from the examples of guides, sailors, hunters, etc., though no man is born with such an instinct of direction as is possessed by some animals, *e.g.* pigeons, dogs.

Method of training it.

6. One of the chief ways, therefore, in which a primary school teacher can help his pupils to turn their study of geography to practical account is by giving them a sense of direction. When teaching the District the teacher should carefully teach the roads and communications from one place to another, beginning with those which start from the boy's home. Every boy should be able to tell the shortest way from his house to any place of importance in the District, the chief places he would pass on the way, and the natural obstacles, *e.g.* rivers and mountains, he would encounter on his journey. He should be taught to use in his imaginary journey such railways as may be available. He should also learn to calculate from the map the approximate distance of the places, and to estimate the time it would take him to reach them whether by road or railway. Boys will take a keen interest in puzzling out the answers to such problems with a map, and in time the ways become so familiar to them that they are able to picture in their minds the position on the map of any place mentioned, just as grown-up people naturally do. But the sense of direction cannot be cultivated by the use of a map only, for while a boy may be able to remember the relative position of two places on a map he may, at the same time, lose sight of their position relative to the place where he is standing. He should, therefore, be practised in describing his journey without a map, *e.g.* 'I should first go five miles east in that direction (pointing) till I

come to the bridge over such and such a river; I should then go northwest two miles, so that the place I want to reach is about there' (pointing).

This use of geography is almost if not entirely neglected in primary schools at present. It is, however, one which is both intelligible and interesting to the pupils. How valuable it is you can realise for yourself if you consider the time, trouble, and vexation which would be saved if people were less liable to lose their way.

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7. The geography of the Province follows naturally on that of the District, and should be taught in the same way. The teacher must be very careful not to rely too much on the text-book, and if the children use text-books not to allow them to memorise them in any way, but only to use them as an aid to memory.

Third stage. The Province.

He should not let the children burden their minds with a multitude of geographical names. After learning the natural features of the Province, and the manner in which they affect the character and occupations of its inhabitants, and the principal means of communication, only those names should be learnt which the children can connect with some fact of interest or importance. This point will be further explained when the geography of India is dealt with.

Avoid teaching too many names.

Chap. v. 5.

8. Map-drawing of the District and Province forms an important part of the teaching. The ability to copy a map correctly is in itself of little use, though it must form the first stage of map-drawing. The object of map-drawing being

Map-drawing.

to impress the picture of the map on the mind, together with the relative position of places on it, it is clear that great importance should be attached to the drawing of maps from memory. It is very common to find a class able to copy a wall map quite neatly and accurately, but quite unable even to draw the outline correctly from memory. It is clear that the map-drawing they have learnt has been of little value. The aim of the teacher should be to enable the class to draw the maps from memory, and thus memory-drawing should be constantly practised.

Fourth stage.

9. In proceeding to the geography of India the teacher should bear in mind that he must connect the new knowledge with that which the children have already acquired. He should first deal with the geography of India in its relationship to the Province which the children have studied. Too often the study of the geography of India degenerates into the memorising of a number of geographical names. Geographical names of themselves have no interest or value. Let the teacher think how often in his own life he has had occasion to use the strings of geographical names (*e.g.* the names of the districts in another Province) which he was made to memorise at school; indeed, how many of them he forgot when he left school. If these names have never been of any use to him, why should he pass on this useless information to his pupils? What his pupils will need is a thorough impression on their minds of the appearance of the map of India,

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with the position of the most important towns and the reasons for their importance, a knowledge of the physical features as they affect the characteristics, industries, and occupations of the inhabitants, some knowledge of the different peoples of India and their languages, and, finally, some knowledge of the chief means of communication from one part of India to another.

Illustration of incorrect method of teaching the geography of India.

10. As an illustration of the wrong method of teaching the geography of India, let us take the usual method of teaching the rivers of India. The boys are set to learn the rivers of India in groups, *e.g.* the tributaries of the Ganges. In ancient times, when travelling was by road, every river was of importance, either as an obstacle on the road, or as a means of shortening a journey, but now-a-days, when, outside his own Province, no one is ever likely to make a journey except by railway, the great importance of rivers has vanished. Only the larger rivers are of importance as transport ways and sources of irrigation. During your life how many rivers outside your own Province have you heard mentioned or read of in the newspapers? You will be astonished if you consider this question to see how small the number is. With the exception of the Indus, the Ganges, the Brahmaputra, and some six or seven other large rivers, you will probably find that your sole acquaintance with the other rivers outside your Province was gained at school, a knowledge which has never proved of any use to you. I take the case of rivers merely as an

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example, and not because their names are of any less value than those of many towns, etc., which boys are often required to memorise in school. Let the teacher, then, use his own experience to guide him in choosing the geographical knowledge which he gives to his pupils.

Connection of physical geography with the character and occupation of the people.

11. When teaching the physical features of a country, connect them not only with the map, but also with the character and occupations of the people. The interests of young children are with man and living things more than with inanimate nature, and the need for employing this interest in their geographical lessons should be kept in mind. Let the children see why jute is grown in E. Bengal, why Karachi is a large port for corn, etc., etc. The class should be led to suggest reasons for these and similar facts for themselves. The importance of the Himalayas as a natural boundary to India should suggest itself to any child who studies the map; and they will readily understand that all the invaders of India came through the passes on the northwest frontier, till European nations began to colonise India from the sea. History as a separate subject is not taught in primary schools, but history in connection with the geography lesson should freely be introduced when necessary. For example, the children should be led to suggest for themselves that the nearer we approach the north-western frontier the more nearly will the languages spoken resemble Persian, the language of the early invaders, while in the south of India the

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Use of history.

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languages of the earlier inhabitants will still predominate. On the other hand, near Madras and Calcutta, which were the first places to be largely colonised by the English, they would expect English to be much more in use.

12. From a study of the physical features the nature of different parts of the country, *e.g.* desert, forest, will naturally follow, together with some account of the climate, *e.g.* monsoons. Flora and fauna.

From the vegetable life we proceed to the animal life. Not only the wild animals indigenous to various parts of India, but also those used for domestic purposes, should be taught; and the reasons why different animals are used in different parts of the country should be suggested by the children themselves.

Not every teacher will be able to give interesting lessons about all the chief places of India, but every teacher should be able to give interesting lessons on some parts of India; and it is better that the children should have an intelligent knowledge of some places in India, and a good general notion of the whole, than that they should have an exhaustive, but quite barren and unintelligent acquaintance with the whole.

p. 6. 13. Finally, the chief means of communication should be taught, *i.e.* railways. We have seen how these should be taught, when dealing with the geography of the District, and when describing a journey to Europe with a higher class it is quite usual for the teachers to require boys to show the route and the chief places passed on the Means of communication.

way; but for some reason it is most unusual for teachers to teach the railway routes through India, though this knowledge is probably of more practical use to the boy than any other part of Indian geography, and also serves to fix in his mind the relative position and distance of towns. Of course the teacher should not attempt to teach all the minor railway lines any more than he should teach all the small rivers; but a well-taught boy should be able to tell the routes he would follow in going from his home to Calcutta, Karachi, Bombay, and other large towns. It will add to the interest if places of importance, such as Dacca, Murree, Srinagar, are included, to reach which part of the journey must be made by water or road.

CHAPTER XIV.

THE TEACHING OF NATURE STUDY.

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Observation needs to be trained.

1. We have seen that boys are naturally quick to notice anything that strikes their attention in their surroundings, but that they do not observe closely, and are careless of details. Nature study should not only show them the relationships and meanings of the objects they observe, but also train them to notice the essential elements of what they see. Good observation does not mean paying attention to everything you see, but the power of noticing those things which you wish to notice. Just as a good memory rejects all that is not worth remembering, and holds securely those points which are of permanent value, so a good observation passes over the trivial and unimportant features of the objects seen, and fixes the attention on those which are important to the observer. Take the example of trained observers: a hunter does not notice peculiarities of scenery or plants which may take the attention of his untrained companion, but he will see signs of game and the animal itself long before his companion does. A sailor will be able to recognise

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the build of a ship that is sighted far off, and even to tell you its size and the direction it is going before you may have been able to make out whether it is a steamship or a sailing-vessel. These are instances of observation trained to special ends, but few people realise how unobservant they are in ordinary matters. Try to draw an animal that you see every day of your life, such as a dog, and you will find at once that your difficulties arise not so much in the use of the pencil, but from the fact that you have never observed the animal carefully. Where do its eyes come? what is their shape? how long is its head compared with its body? these and other such difficulties confront you at once. Again, are there not some words which you still find a difficulty in spelling aright, although you have seen them hundreds of times?

Aim of nature study.

2. Nature study should train boys to notice the essential peculiarities and qualities of the natural objects they see around them, and should assist them, by giving them such reasons for these qualities and peculiarities as they would be unable to discover for themselves, to take an intelligent interest in the natural world. Chap. vii. 7

Value of nature study.

3. Nature study is a peculiarly suitable study for children in a rural school, because, without requiring any other instruments but their senses, their intelligence, and their natural surroundings, it opens up to boys a wide field for intelligent thought. Many boys who leave a rural school

for farm work will have no further opportunity to read books; such other reading, writing, or arithmetic as they may do will be of a very practical character. But if a boy has learnt to take an interest in the animals, plants, and the natural world around him, there is no reason why the habits of wider intelligent thought which the school has, or should have implanted in him, should die out. All boys are not by character equally interested in this study, but there are very few boys to whom it does not in some way appeal.

Defects of the object lesson system.

4. Nature study teaching, in the form of the object lessons usually given in a primary school, is neither intelligent nor interesting. It is not intelligent, because it does not build on the pupils' previous knowledge. What should we think of a teacher if he began his work with his new boys by teaching them to say 'mama,' 'papa'; and yet a teacher does not see that he is equally ridiculous when he gives boys (sometimes not even junior boys) a lump of sugar, and tells them to taste it and notice that it is sweet, or when he points out to them in a picture that a cow has four legs and two horns. It is not interesting, because it is purposeless. Each lesson has generally no connection with the one before: the few (if any) new facts learnt by the children are disconnected and lead nowhere. The children see no purpose in the lesson; they do not see, for instance, how learning to name the parts of a flower helps them to do anything.

Method. General principles.

5. As the stages in the teaching of nature study depend entirely on the curriculum laid down by the education authorities, it is not possible to describe the methods of teaching stage by stage. We must be contented with describing the general methods to be followed. In the first place the lessons should be grouped together in series. The teacher's aim is to give the children a knowledge of the relationships between things and the causes underlying them. This he can only do by grouping and comparison. An ox by itself is neither big nor small; it is big compared with a rat, and small compared with an elephant. The causes of germination and growth are the same in an oak and a buttercup. Let him then group his subjects in connected lessons, and show by comparison their points of resemblance and points of difference, and let him lead the children to suggest reasons for these points of difference. Very often the reasons suggested by the children will be quite wrong; but, if the suggestions show intelligent thought, the exercise has been of value.

Specimen series of lessons.

6. The earliest lessons prescribed will probably be about animals, because children are chiefly interested in living things. Let us suppose one group of lessons to be 'Beasts of Burden.' The teacher will naturally take for a basis the animal most commonly used in the neighbourhood, possibly the camel. Before giving the lesson he will have told the children some days before the subject of it, and have asked them to observe the animal for themselves out of school, and to

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compare it with a horse or some other common domestic animal. When the lesson begins he will find out what special peculiarities they have noticed, and will draw attention to others (using a picture) which they have overlooked. He will then try to lead the children to discover for themselves some of the reasons for the camel's peculiarities—his long neck, his flat foot, his mode of chewing, etc.; also, his advantages and disadvantages for transport purposes when compared with other animals, *e.g.* his ability to go without food for long periods, his suitability for work on sandy tracts, contrasted with his slowness, his stupidity, etc. In these and other points he will compare him with other beasts of burden. In the same way he will treat of other animals, *e.g.* ox, donkey, in consecutive lessons; and towards the close of the series the teacher may interest the children by telling them of beasts used in other parts of the world.

Nature study teaching in school must be based on practical nature study out of school.

7. From the above short sketch one important principle will be observed, namely, that the nature study done in school must be based on the practical nature study done by the children out of school. The teacher should always set beforehand the subject for the next lesson, which will then consist in systematising the results of the children's observations, adding to them such facts (*e.g.* as to the internal structure of an animal) as they could not discover for themselves, and, finally, deducing from the facts a few general rules and reasons. The children should be encouraged

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to ask the teacher questions during the lesson; but he must see that the questions do not lead him too far off the point of the lesson.

With the older children the subjects set may take the form of problems, *e.g.* is there any way of telling a flesh-eating from a grass-eating animal? Why can a cat draw in its claws, and not a dog? Why are rice and maize grown on different kinds of ground? etc. A teacher must come well-prepared to a nature study lesson; otherwise the interest children naturally take in their discoveries will lead them to ask questions which he will be unable to answer.

Uses of objects and illustrations.

8. Wherever possible the teacher should use the natural objects to illustrate his lessons; but when, *e.g.* a lesson on an elephant, it is impossible to bring the natural object into school, he should use pictures. Frequent use must be made of the blackboard, *e.g.* sketches of a camel's foot and a horse's foot. If the teacher is not quick at drawing he should prepare the sketches before school begins.

Chap. iii. 8. Chap. viii. 8

Use of technical terms.

9. Technical terms should be avoided as far as possible; these are only of use as helps towards some further idea. For example, it is necessary to explain the meaning of the word pistil when we are going to compare one flower with another. In itself the term 'pistil' does not help us to understand a flower at all, but it saves a good deal of time to use one word for this object when we are comparing various flowers, instead of describing it by a phrase every time

Nature study, if taught in this way, cannot fail to interest boys, and if a firm basis of knowledge about elementary objects is laid in school, together with the habit and power of sound observation, the boys after leaving school will see meanings in the natural world around them which are hidden from their uneducated neighbours.

CHAPTER XV.

THE TEACHING OF DRAWING.

Value of drawing as a means of expression.

1. We have seen how speech and writing are the means by which we express our thoughts: drawing is yet a third means. It is true that we use speech and writing for this purpose much more than drawing, but this is because the value of drawing as a means of expression has only recently been 'revived.' I say 'revived,' and not discovered, because 'drawing' was used for this purpose before ordinary writing. The earliest written communications we find are all in the form of pictures. You will realise how useful drawing is as a method of expression, if you think how difficult it is to recognise a person from a written description, and how easy if you have once seen a picture of him. By teaching children to draw, then, we are giving them a most useful power of expression.

Chap. ix. 1. Chap. x. 1.

Method. First stage. Defects of old methods.

2. Just as writing used to be taught by beginning with the parts of the letters, and reading by beginning with letters instead of words, so the teaching of drawing used to begin with requiring children to draw straight lines and curves. Now

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this method, like the old methods of teaching reading and writing, is neither intelligent nor interesting. All children like to draw, but they like to draw something intelligible, and not meaningless lines and curves.

Again, school drawing used to consist chiefly of drawing from copies. In real life the ability to draw from a copy is of very little use, and the ability to draw from a copy well by no means implies the ability to draw from a real object.

Drawing should be from objects, not from copies.

3. Since we wish to teach children how to represent things which they see, the teacher should start by giving the class real objects to draw from. At first the objects must be of the simplest nature—a pencil, an envelope, a slate, etc. Now, the key to all drawing is a proper sense of proportion, first between different parts of one object, and then between one object and another. So the chief aim of the teacher in this stage is to train the children to observe the correct proportions of the object they are drawing, *e.g.* the length of the top of the slate compared with that of the sides.

The key to drawing is a sense of proportion.

Method of object drawing.

4. The teacher should place the object to be drawn in a conspicuous place in front of the class; for instance, on his table or fixed to the wall. He will point out and discuss with the class the nature and length of each stroke to be drawn, let them draw it, and then draw it himself on the blackboard, He should not draw his line till they have drawn theirs; otherwise the children will simply copy his drawing, and not try to

draw the object itself. When the drawing has thus been built up line by line by the children on their slates or paper, and by the teacher on the blackboard, the children will compare their drawings with his, and see how his drawing gives a better picture of the object than theirs do. They should *not* correct their drawings from his, as the aim of the teacher is to make them draw correctly from the object; but when the most common mistakes have been discussed, the teacher should rub out his drawing, and the class should then see if they cannot make a better copy of the object, while the teacher walks round and helps those who have shown the worst results at the first attempt. This form of lesson may be usefully adopted for practically all the drawing lessons in a primary school.

Size of object immaterial.

Since the teacher in this stage is not trying to teach the proportions between different objects, but only the proportions contained in one object, it does not matter what size the object is, whether a key, a spade, or a door, so long as it is a familiar one, in the drawing of which children are likely to be interested.

Rubbing out to be avoided.

5. In the earliest lessons probably the children will draw on slates, and a certain amount of rubbing out will be necessary; but the teacher should discourage rubbing out as much as possible. If the nature and length of each stroke is properly discussed by the teacher with the class before it is drawn, the rubbing out will be reduced to a minimum.

6. Frequently, at the close of a lesson, the children should be required to draw rapidly from memory some object which they have drawn in a previous lesson. This exercise may be varied by the teacher telling them that in the next lesson he wants them to draw some object from memory, which they must observe out of school, *e.g.* the horizontal bar. Or, again, he may hold up before them some simple object, *e.g.* a knife, for a minute, and tell them to observe it closely; then put the object away, and tell them to draw it from memory. The aim of all these exercises is to teach the children to observe the proportions of objects quickly and correctly, and to carry the pictures of the objects in their heads.

Memory drawing.

Snapshot drawing.

7. Children, as we have seen, are chiefly interested in life; and they are very fond of representing motion. It is impossible for them to draw human and animal forms correctly, but, if these forms are represented by strokes and ovals, there is no reason why they should not be introduced at once to add interest to the lessons. A man walking, running, sitting, kneeling, boys playing ball, flying kites, dogs running, etc., etc.; all these, and many more, can be represented by simple lines. The one thing on which the teacher must insist is that the lines representing the body, legs, etc., must be correct in proportionate length. (The head of a child is larger in proportion to the body than that of an adult.)

Drawing of life and motion.

8. Drill in mass drawing on slates is also useful, *i.e.* the drawing of circles and ellipses, with

Mass drawing.

the pencil starting from a central point and describing circular or elliptical lines of gradually increasing size, and without lifting the pencil from the slate. With a few little touches, leaves, legs, etc., can be added to convert the results into apples, ducks, and so forth, to make them more interesting. The object of these exercises is to give the children a free command over the pencil.

Second stage. Proportion of two or more objects.

9. In the second stage the proportion between different objects must be taught. At first similar objects—*e.g.* balls of different sizes—will be placed on the table at an equal distance from the class, and the children will be required to show by their drawing that they have recognised the relative sizes of the objects.

Proportions altered by distance.

10. But objects also differ in size to our sight, according as they are near or far from us. The next step, then, is for the teacher to place similar objects (two only at first) of the same size at unequal distances from the class, and to show them, first by illustrations on the blackboard, and afterwards by drawing with the class (as described in paragraph 4), how we represent distance by reducing the size of remoter objects. This will need very careful teaching, and the teacher should not proceed to the next step until the class has thoroughly mastered it. This next step will naturally be the representation of two or more *dissimilar* objects, *e.g.* a ball and an ink-pot, first side by side, and then at unequal distances from the class.

Memory exercises.

11. Constant practice should be given in memory exercises. In this stage the memory drawing will not be confined to the drawing of single objects, but will also include the drawing of two or more objects grouped together, *e.g.* an apple and an orange side by side, two oranges of which one is three feet further off than the other. The exercises in memory drawing should, of course, be much simpler than those in object drawing.

Third and fourth stages.

12. The curricula for the upper classes vary considerably, so it is not possible to draw up any general lines of procedure. But in the higher classes the children will probably be required to group objects so as to form a picture, and may also learn shading and the elements of perspective, which is simply the alteration in the proportions of a single object, caused by one part of it being more distant than another. The easiest way to begin the teaching of perspective is by means of the ellipse which appears at the top or bottom of a cylindrical object, such as an inkpot, according as it is held below or above the eye.

General principles.

13. A few general rules are appended:

(i.) It is better for a child to start a whole drawing afresh, after careful observation of the object, than for him to produce a correct drawing after constant rubbing out and alteration.

(ii.) The most useful form of drawing is that which enables us to illustrate for another's benefit an object which is not present.

So memory drawing should be constantly practised.

(iii.) The teacher is not training the boys to become artists; he should, therefore, aim at producing a good level of drawing in the class, and not be satisfied with the good results of a few boys who may have natural talent.

(iv.) When chalks are used the colours of nature should be copied. There is neither use nor beauty in purple horses, green dogs, etc.

(v.) The subject of a drawing lesson should always be such as can be completed in a single lesson. It is better to leave a drawing unfinished (though if the subject has been properly chosen that should never be necessary) than to set the children to the uninteresting task of completing it in a second lesson.

(vi.) As a sequel to the preceding principle, the teacher must encourage rapid drawing. The time should be spent in the observing of the object, not in the actual manual work of drawing it, which should be very rapid.

CHAPTER XVI.

THE TEACHING OF DRILL.

The object of school drill.

1. Since primary education is to lay the foundation for life in general, the schoolmaster is concerned with the bodies of his pupils as well as with their minds. This fact is recognised by the inclusion of drill in the primary curriculum. The teacher must not mistake the object of school drill. Two views as to its aim are very prevalent among teachers—(i.) that drill is intended to develop the bodily strength of their pupils; (ii.) that drill is a recreative exercise. Neither of these views is correct. (i.) If drill were the only form of bodily exercise taken by schoolboys, it would certainly be necessary in order to prevent their bodily development from being stunted. But as a matter of fact boys spend most of their time out of school in bodily exercise, whether work or play. Moreover, fifteen minutes' drill every day, or perhaps every other day, is not likely to make any appreciable difference in their natural strength. Many boys who have never attended school or been drilled are much bigger and stronger than schoolboys of the same age.

Incorrect views. (1) Muscular development. (2) Recreative exercise.

(ii.) Drill is certainly useful in enabling boys to stretch their limbs, which would become cramped if they sat too long in school. But the same result could probably be better obtained by letting the boys play some game. Certainly an elaborate system of exercises would not be needed for this purpose. Moreover, drill requires close attention and does not relax the mind.

2. The courses prescribed for school drill are evidently designed towards some definite end. We have seen that this is not the development of strength, except in so far as the exercises do not allow any part of the body to remain neglected; indeed, the exercises do not appear to be directed towards special muscular development. We have also seen that drill cannot take the place of games as a mental relaxation. What then is its object?

Correct view. Skill in the use of the body.

If you consider the exercises thoughtfully, you will see that they are designed to teach skill in the use of the limbs and a ready command over them. This does not come by nature any more than other forms of skill come by nature. Learning to walk, for instance, is a long and laborious task for infants, and, though boys can of course walk when they come to school, you have only to look at a class which has been well drilled in marching, or at a soldier, to see how far this simple form of skill can be improved by training. It is the same with other motions. It is only by constant practice in making movements in the right way that we learn to make them neatly, rapidly, and without unnecessary effort. Take

another example. A small boy, learning to write, grips the writing-board, screws his body into an unnatural position, holds his pen very tight, and probably also follows the motions of his hand with his tongue. What a great deal of unnecessary effort! When he can write fluently all these unnecessary muscles are relaxed. Take, again, a boy who has come to school later in life than most boys, and is big and strong. He will probably think that the drill learnt by the other boys is wasted on himself. But tell him to perform some simple exercise, such as to touch with his right toe a spot six inches before him, and then one six inches behind him in rapid succession several times; he will almost certainly lose his balance and wobble about, and his motions will be clumsy. All these examples have been given to show that, without practice, we lose the power of performing simple motions with our limbs, which we may not be called upon to do every day of our ordinary life, but which may be very useful to us on occasion, and also that even the most ordinary movements will be performed with much greater rapidity and ease after a course of drill.

Illustrations of the need of training to acquire such skill.

3. The drill courses generally used in India, based on a series of indigenous exercises for the body, are probably as suitable as any in the world for the purpose of developing skill in the use of the limbs. A boy who has been properly taught the drill course of an Indian primary school should be as active in body as he is in mind. It

General rules of procedure.

is not necessary to deal with the exercises in detail, and only some general rules for the guidance of teachers will be given:

(i.) In the attainment of bodily skill it is as necessary for the boy to use his mind and will as it is in the acquirement of other forms of skill. A boy cannot perform drill exercises properly without concentrating his attention on them. The slack and lifeless drill which goes on at some schools is quite valueless. Attention is needed for the simplest exercise; indeed, it is needed for standing still. Children when comfortably seated in the class-room may be able to remain still for considerable periods, but you will find it is quite otherwise if you wish them to stand at attention even for two minutes in the playground. Do not think, then, that there is any relaxation of the mind in properly executed drill.

(ii.) The position of the whole body is of importance in each exercise, not only the position of the limb that is being moved. For example, when the arms are raised above the head, the feet should be firmly planted, the body erect, the head thrown back, and the arms stretched to their fullest extent.

(iii.) The movements should be executed smartly on the word of command. This is most important. A well-drilled class will

execute the movements as soon as the words of command leave the teacher's mouth, so that it appears as if the limbs themselves obeyed the teacher's commands without any effort of will on the part of the children. Such a result can only be achieved by constant attention and practice.

(iv.) Vary the exercises as much as possible. Remember you are not trying to develop any particular muscle, but to give each boy a ready command over his whole body; so never go on with an exercise so long that the muscles used are likely to feel tired. Even teachers who do vary their exercises are apt to give the class too many consecutive exercises on one part of the body. An arm exercise should be followed by a leg exercise or marching, and that again by a body exercise. Only in this way will the boys learn to use at once any limb, which they desire to move, quickly and without unnecessary effort.

(v.) The teacher should move about as little as possible. When teaching a new exercise it will no doubt often be necessary for him to go up to individual boys and help them to attain the right position. But once this has been learnt the teacher should direct the drill from one spot, so that all the members of the class may feel that his eye is on them.

(vi.) The teacher should very seldom be silent during the drilling lesson. He should be watching the whole class, and calling out directions to those boys whose position is incorrect, or who are drilling slackly. 'Head up, Abdullah,' 'Shoulders back, Ram Chand,' etc., etc. This is what is meant by *teaching* drill. Merely showing boys the exercises is of no more use than giving boys copy-slips and letting them teach themselves to write. Chap x. 5.

CHAPTER XVII.

SPECIAL DIFFICULTIES OF TEACHING IN RURAL PRIMARY SCHOOLS.

Peculiar circumstances of teachers in sole charge of schools.

1. The teacher in a rural primary school in India is generally in sole charge of the whole school. This fact exercises a very great influence on his work. If he has learnt at a training school to construct a time-table for a single class, and how to prepare elaborate notes of lessons, he gives up all these accomplishments when he starts single-handed in a primary school. He feels that the training school prepared him for work under conditions quite other than those with which he is faced, and only too often discards wholesale the methods he learnt there, and relapses into the primitive methods of school organisation and discipline of the untrained teacher. Now, it is not the teacher's fault, but that of the training school, if the training has not been arranged with a view to the future work of the teacher, but it *is* the teacher's fault if he rejects the useful part of his training with that which is inapplicable to his present circumstances.

Teachers should not abandon the methods learnt during training.

2. In the first place, there is no reason at all why he should not map out the work of the year for each class, month by month. Indeed, if he does not do so he is sure to find himself in difficulties at the end of the year; one class will have finished its reading-book, while another class will not be near the end of its course. Again, if the teacher cannot prepare detailed notes for each lesson, as he did in the training school, he can at least make some preparation for his lessons, as pointed out in Chap. VIII., paragraph 4. Finally, the teacher has no excuse for abandoning the methods of teaching which he learned at the training school. That many teachers do so can only be attributed to their own laziness and unfitness for the teaching profession.

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The first new difficulty. Preparation of a time-table.

3. So far all that the teacher has learnt at the training school will stand him in good stead, but he may now find himself faced with problems for which he has not been adequately prepared. The first of these will be the preparation of a time-table. If a teacher in sole charge of a primary school attempts to frame a time-table, he usually does so in order to please his inspecting officer, and he makes very little effort to follow it. Most such teachers, however, give up in despair any attempt to frame a time-table. Now you will see that if a teacher, who takes one class only, needs a time-table in order to ensure that he allots the right amount of time to each subject, a teacher who not only takes several subjects, but also several classes in them, is in much greater need of a

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time-table; otherwise not only will he be likely to devote too much time to one subject at the expense of another, but one or two classes are likely to receive more than their due share of his time and attention. This, as you know, is what actually takes place in most primary schools; the infant or 1st class, which needs specially careful teaching, usually receives a very small share of the teacher's attention.

Difficulties in preparing a time-table for a single-teacher school.

4. The first difficulty which the teacher finds, if he tries to draw up a time-table, is that of occupying the other classes while he is teaching one himself. The second difficulty arises from the fact that the classes are probably of very uneven size. Is the teacher to allot half an hour for reading to the 4th class, consisting perhaps of two boys, and the same amount of time to the 3rd class, consisting perhaps of fifteen boys? The third difficulty is material, and arises from the fact that very few primary schools or teachers are provided with timepieces; so that it is generally impossible for a teacher to divide up his day into exact periods.

Evils resulting from not following a time-table.

5. The consequence is that the teacher gives way to these difficulties, calls up one class after the other at random for oral work, while of the other classes one may be set to do writing, and the others are left idling, while nominally employed in reading their text-books. To this pernicious system are due the habits of mental laziness which are such a marked feature of Indian schools. The boys are too small to do

anything by themselves except learn unintelligently by heart, or write carelessly on boards. They are being deliberately taught the practice of wasting their time without making a noise. Their whole attention is directed *not* to what they are doing, but to the purpose of keeping quiet and of not interrupting the teacher.

Methods of overcoming the difficulties. (1) Keep the whole school occupied.

6. Now, boys can be kept quiet not only by making them fix their attention on keeping quiet, but also by giving them something to do which so interests them that they do not feel inclined to be restless. Boys cannot fix their attention on two things at the same time; if they are chiefly concerned with keeping quiet they cannot pay much attention to the work they are doing. If, on the other hand, their attention is engaged in the work they are doing, they are quiet without any conscious effort to be so. The former plan is that usually followed in primary schools; the latter is the correct plan. If the whole of the school time was filled with interesting work, primary schools would be much less dull and far more popular. There are a good many subjects which a class can do by itself without the immediate supervision of the teacher, and yet which are interesting and useful. There are fewer in the infant class than in any other, while this class has also very little ability to work by itself. It should therefore have shorter school hours. Every hour that these little boys spend idly in school does serious harm to their intelligence and power of application.

The second difficulty, that of the uneven classes, can be overcome by making the periods of oral work of uneven length, proportionate to the number of children in each class. (2) Oral periods should vary in length.

The third difficulty, that of measuring the periods, can only be satisfactorily overcome by the provision of timepieces to primary schools; and work can never be thoroughly efficient till this is done. This, however, is a matter for controlling bodies to decide, and does not lie within the power of the teacher. Meanwhile the teacher must estimate the length of periods as well as he can, just as he does at present. (3) Provision of time-pieces the only satisfactory solution.

7. The simplest method of offering a solution to these difficulties is to give a specimen time-table for your consideration. This time-table will not of course be suitable for every school, but it illustrates the methods by which the preceding difficulties can be overcome, and it also has the merit of having been in use for some time in single-teacher schools, and having proved successful. Specimen time-table described.

(i.) The first principle on which this time-table is based is that, as there are two subjects, arithmetic and reading, which must be taken with each class every day, it is best for the teacher to assign one period only for each of these subjects, and to take them, class after class, with the whole school in that period. (The particular advantage of this system you will see under note 3.) Arithmetic, which is

the subject which requires the clearest thought, is taken for the first period when the boys' minds are fresh. Every boy, on coming into school, knows that this is the arithmetic period and gets out his books at once. The 2nd and 3rd classes will find sums set for them on the board before school by the teacher. Similarly, the reading period always comes immediately after the break. A great deal of time is saved by the children knowing beforehand what they are going to do next. Chap. viii. 2, 2

(ii) The second point to notice is that no definite length of time is necessarily provided for each subject. The time put above each period would be followed if there is a timepiece in the school. Otherwise it will be sufficient for the teacher to spend about an hour on arithmetic, about an hour and a half on reading, and about half an hour on the other subjects. After a little practice the teacher should be able to make his lessons of about the right length. Indeed, teachers are already obliged, if they have no timepiece, to make rough estimates of the time in this way. p. 4

(iii.) While it is necessary to fix a certain period for the whole arithmetic and reading lessons, either by the clock or by estimation, it is neither necessary nor desirable

TIME TABLE

(FOR SINGLE-TEACHER SCHOOL, CONTAINING ABOUT 40 PUPILS).

1st Period (Approx. 1 hr. 15 min.).	2nd Period (Approx. 1 hr.).	Break.	3rd Period (Approx. 1½ hrs.).				4th Period (½ hr.).
ARITHMETIC.			LANGUAGE.				
IV. Oral. Written.	Geography Writing Nature Study (each 2 days in the week).	Composition Map Drawing (alternate days).	Rewrite Comp. or continue Map Drawing.	Transcription.	Prepare Reading and Recit.	Reading.†	Drawing, Persian or other optional subjects.
III. Written. Oral. Written.			Rewrite Comp. or continue Map Drawing.	Prepare Reading and Recit.	Reading.†	Transcription.	
II. Written. Oral. Written.	Map Drawing Transcription (alternate days).	Geography* Writing	Prepare Reading and Recit.	Reading.	Transcription.	Dictation of words by III. Class Pupil.	
I. — — — Oral.	Writing.	Nature Study (each 2 days in the week).	Reading.	Tables (with Senior Pupil).			

Underlining shows the position of the Teacher.

* The 1st Class may be let out to play on the two days that the 2nd Class does geography.

† For one period at least with the 3rd and 4th Classes dictation will be substituted for reading.

to fix the length of the oral work with each class so exactly. On the contrary, the oral lessons should vary in length, according to the number of boys in each class. The whole arithmetic lesson, for example, will consist of about one hour and fifteen minutes. Between each oral lesson the master must spend about five minutes in going round the school and looking at the work of the classes who are engaged in written work, correcting their mistakes, and helping them in their difficulties. This will leave him about an hour for giving oral lessons to the four classes. Let us suppose the classes are constituted as follows: 1st class, fifteen boys; 2nd class, ten boys; 3rd class, ten boys; and 4th class, five boys. He would then divide his time up approximately as follows: 1st class, twenty minutes; 2nd class, fifteen minutes; 3rd class, fifteen minutes; 4th class, ten minutes. On the other hand, if one class is good at oral work and another weak, he would naturally give the weak class more than its fair proportion of time. But no class should receive less than ten minutes oral instruction in arithmetic every day. Oral instruction will include not only mental arithmetic, but also oral explanation of new rules. If one class has a new and difficult rule to learn, it will receive a

longer period of oral instruction that day, and the other classes shorter periods.

This may at first appear complicated, because it has been described in detail, but in reality it is a very simple system. Before school the teacher will set sums for the 3rd and 2nd classes on the blackboard. When the boys come into school they will get out their slates and set to work at once. The teacher will call up one class after another for an oral lesson, giving to each the amount of time which the numbers in the class and the nature of the work demands; between each oral lesson he will spend a few minutes in going round to look at the work of the boys who are writing.

Exactly the same procedure will be followed in the case of the reading lesson, which will include oral composition and recitation.

(iv.) You will note that for geography and nature study and writing the school is divided into two sections. For writing this will always be possible, as a teacher should be able to supervise the writing of two classes in one half-hour period. If the curriculum is so drawn up that it is impossible for the teacher to combine two classes in geography and nature study, he should follow the system adopted in the arithmetic and reading

lessons. For two days in the week he would spend the second period at nature study, taking each class in turn orally while the rest of the school is engaged in transcription. For another two days he would spend the second period on the teaching of geography in the same manner, while the rest of the school is engaged in map-drawing.

(v.) The length of the break will necessarily vary to suit local conditions, but it should be long enough for the teacher to take a section of the school at drill, and also to correct the composition and transcription which has been done during the second period.

(vi.) You will note that the 1st class, according to this time-table, enter school half an hour after the other classes, and leave earlier. It is a great mistake to think that any benefit is derived by small boys from sitting idle in school. On the contrary, to make a little boy sit quiet without giving him anything profitable to do merely represses the activities natural to his age, and which are so essential to his development. Moreover, a little boy is unable to do any profitable work without help and supervision. Since the teacher is too fully occupied to devote all his time to the 1st class, it is better for him to employ a senior pupil to assist them

during the periods when they must be left to themselves. This pupil should be selected not because he is the most advanced pupil in the school, but because he shows some natural aptitude for helping small boys in their work. After trying several of the senior boys, the teacher will soon discover the pupil under whose supervision the infant class make the best use of their time.

If Kindergarten work is taught in the 1st class, it should be taken immediately after the break before the other classes are admitted.

Specimen table for two-teacher school.

8. In a large number of schools the staff consists of two teachers. The preparation of a time-table for such a school is correspondingly easier, but, since many teachers may find a difficulty in constructing it, a specimen time-table is given for their guidance.

This time-table does not call for much comment, as it is based on the same principles as the single-teacher time-table, the chief of which is simplicity.

Here, again, the oral lesson will vary in length in proportion to the numbers in each class. If the teacher, seeing that he has only two classes, divides his time evenly between the two, he may find himself devoting a whole period to the teaching of five boys in one class, and the same time to the teaching of twenty in another class. Although the head teacher will naturally take the two top

TIME TABLE

(FOR PRIMARY SCHOOLS WITH TWO TEACHERS).

Class.	45 minutes.	45 minutes.	45 minutes.	Break.	40 minutes.	40 minutes.	30 minutes.
IV.	Arithmetic. Oral. 15′ Written. 30′	1. Geography 2. Map Drawing (alternate days).	Nature Study (combined classes 3 days).	DRILL. 15 minutes for Upper and Lower Sections on alternate days.	Reading and Recitation.	Composition.	Optional Subject.
III.	Arithmetic. Written. 30′ Oral. 15′	1. Map Drawing 2. Geography (alternate days).	Writing and Dictation† (combined classes 3 days).		Transcription Composition (alternate days).	Reading and Recitation.	—
II.	Arithmetic. Oral. 15′ Written. 30′	1. Geography 2. Writing and Spelling (alternate days).	Nature Study (combined classes every day).		Transcription Map Drawing (alternate days).	Reading and Recitation.	—
I.	Arithmetic. Oral. 20′	Writing.*			Reading and Recitation.	Tables (15′) (with Senior Pupil).	—

Notes.—1. The length of Break may vary with local conditions.
2. *On the days when the 2nd Class is writing, the assistant teacher should give a writing lesson to the 1st Class.
3. †The teacher will give dictation for about 20 minutes to each class two days in the week while the other class is writing.

classes, he should not neglect to exercise a constant supervision over the work of his assistant; and at least once a week he should exchange a period of work with him in order to see that the work of the juniors is progressing satisfactorily. He must also insist that his assistant keeps to the scheme of work drawn up for each month in the year.

Difficulty arising from irregular admissions.

9. A second difficulty arises in primary schools from the fact that boys are admitted at different periods of the year.

If boys coming later in the year are admitted into one of the higher classes, they must have been studying at some other school, and should find no difficulty in picking up the work of the class. Again, if boys are admitted into the 1st class within a month or so of the commencement of the session, they may be trusted to pick up the work they have missed, and the wise teacher, though he will pay special attention to late comers, will not disorganise or interrupt the work of the class on their account. He will continue to take the class as a whole, and will find that the newcomers, if they have ordinary ability, will in four or five months be on a level with the boys who entered at the beginning of the session. This is due to the natural rivalry of children and the desire, common to both children and adults, of every individual to be like his neighbour. This point is important, since it is through ignoring these instincts that teachers cause themselves unnecessary trouble in dealing with boys who enter at still later periods during the session.

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The interest of the majority of supreme importance.

10. The rules of the school, just like the laws of the state, are laid down in the interests of the majority, and sometimes cause hardship on the individual. This cannot be helped. It is the duty of the schoolmaster to work in the interests of the school as a whole, and not in the interests of any one individual. This does not mean that the teacher should not study the character and abilities of individual pupils, and make due allowances for natural peculiarities, *e.g.* shyness, stammering. But it means that the distribution of his time and of the work to be covered during the year should be made in the interests of the average majority in the school. And what is true of the school is also true of the class. Now, while a teacher does ordinarily recognise this principle when dealing with the higher classes in the school, he is apt to ignore it when dealing with the 1st class. Only too often he treats the 1st class not as a class at all, but as a collection of individuals, each of them coming to him for private tuition. Some of the evils resulting from this have been pointed out in the chapter on reading. The teacher adopting it has ignored his duty to the majority of his pupils. Chap ix. 5.

Method of treating late admissions.

11. Let the teacher make up his mind, then, that he will not have more than three sections in his 1st class. The first section will consist of boys joining within two months of the beginning of the session, together with those who came towards the close of the preceding session; the second section will consist of all those who enter

the school towards the middle of the year; the third section will consist of those who join in the last quarter of the year. The last section will not have time to make much progress before the close of the year, and they will have to start again with the beginners at the commencement of the next session. This cannot be helped; the interests of the class, as a whole, must not suffer for the interests of such late comers. The first section should of course all be fit for promotion at the close of the year. Whether the second section is fit for promotion or not will depend partly on ability, partly on numbers; if the boys in it are few and bright, the teacher may be able to cover the whole course with them in half the time he takes with the first section. But do not let him make the mistake of trying to teach them individually. Every boy as he comes in must be assigned to one of the sections.

It will not always happen that admissions are made irregularly throughout the year, and the teacher may be able to reduce the number of sections to two, in which case his work will be correspondingly simplified and improved.

General summary.

12. To sum up the points in this chapter, the teacher of a primary school should organise the work of his school very carefully, preparing a plan of work first for the year, then for the days of the week, and finally, for each lesson. Every year that he does this the work will become simpler. Having arranged his schemes of lessons for the benefit of the average boys in each class,

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let him take a personal interest in the work of each pupil, considering the boy's character not only from the point of view of his work in school, but also from that of the home from which he comes. When a teacher gives as an excuse for decreasing enrolment the plea that the parents do not care about education and do not wish to send their sons to school, he may be generally sure that what the parents do not care about is the particular education which he gives in his school. This indifference very often arises from the feelings of the boys. If the pupils realise that their teacher is really efficient and painstaking (and boys know very well when their teacher is either lazy or incompetent), and if they find that the hours which they spend in school are not, as is too often the case, largely spent in idling, then they can make a school popular in spite of the apathy of the parents. It is true that parents in this country very often fail to realise that they owe a duty to their children quite as great as their children owe to them, and that they often keep their children out of school for selfish reasons, without any regard to the children's interests. The teacher should be very careful not to give such undutiful parents another excuse to offer, namely, that their children, if sent to school, will only waste their time, learn nothing that is useful to them, and be no better fitted for life than if they had gone without education.

APPENDIX.

NOTES OF LESSONS.

A. SIMPLE SUBTRACTION.

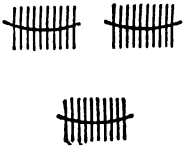
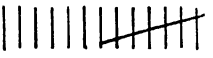
Class I. *Time :* ½ hour.

Stage reached. The class has been practised in oral addition, subtraction and analysis of numbers up to 20, and the simplest form of written subtraction.

Aim. To teach process of subtraction when the unit to be subtracted is larger than the unit above it.

Apparatus. Bundles of ten matches, some loose matches, coloured and white chalk.

1st Stage.	*Lesson.*	*Blackboard.*
To give the class an interest in aim of lesson.	Tell the children they are going to learn how to do subtraction sums which are too difficult for them to work mentally. Ask them some sums of increasing difficulty, *e.g.* I have twelve miles to go to Peshawar and have walked seven ; how many miles have I left to go ? There are sixteen boys in a class, and five are absent ; how many are present ? Twenty-five boys go up for an examination, and nine fail ; how many pass ? Proceed till the boys are unable to answer mentally ; probably the last sum will be too hard for them. Then say this must be done by written subtraction.	
2nd Stage.		
Concrete working.	Count out two bundles of ten and five loose matches. Now ask a boy to take away nine matches from the	

	Lesson.	*Blackboard.*
	twenty-five. Difficulty involving untying of one bundle. We now have one bundle of ten and fifteen loose matches. Take away nine matches, leaving the bundle and six matches. Get class to name the result. Represent the preceding on the blackboard, using coloured chalks for the tens, and white for units. Draw two bundles of ten in coloured chalk, and five white units. Cross out one bundle, and draw ten more units in white. Cross out nine of these. Get class to name the result.	Tens  Units 
3rd Stage. Final form of sum.	Ask one boy to write 25 on blackboard, using coloured chalks for tens and white for units. Ask another to write nine beneath the units, and draw a line. Question as to the value of the 2 in the tens column, and suggest taking one ten to help the 5 in meeting the requirements of the 9 beneath. Lightly cross out 2 and write 1 above it, and write 15 in units column. Then subtract 9 from 15 = 6, nothing from one ten = one ten. Get class to name the result.	 Tens Units 1 15 9 1 6
4th Stage. Generalisation.	Elicit explanation that 25 = not only 20 + 5, but also 10 + 15. Give other similar examples, *e.g.* If I am eight and my brother twenty-three, how much older is he? It is the 17th of the month, and the month has 31 days; how many more days are there in the month? Work these examples with class on blackboard. Finally elicit from the children the generalisation that when the units are less than the number below them, a ten may be used from the tens column. (The crossing out, etc., will be dropped later.)	Tens Units Tens Unit 1 13 2 11 8 1 7 1 5 1 4

B. *The same lesson, rough notes for school use.*

SIMPLE SUBTRACTION.

N.B.—Bundles of ten matches, some loose matches, coloured chalk.

You are going now to learn to do subtraction sums which are too hard for you to work out in your heads.

I have twelve miles to go to Peshawar, and have walked seven; how many miles have I left to go? Sixteen boys in a class and five absent; how many present? Twenty-five boys go up for an examination, and nine fail; how many pass?

Stop when class is puzzled.

Tens

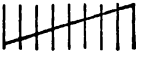
Units

Use two bundles of ten and five loose matches.

Let one bundle be broken up.

Have result named.

Represent on black board, coloured chalk for tens.



Write sum, coloured chalk for tens.

Ask value of 2 in tens column.

Elicit explanation that 25 = not only 20+5, but also 10+15.

Tens	Units
1	15
–	9
1	6

If I am eight and my brother twenty-three, how much older is he than I?

It is the 17th of the month, and the month has 31 days; how many days are there in the month? etc.

When the units are less than the number to be subtracted from them, a ten may be taken from the next column to help them.

Tens	Units
1	13
	8

A. RIVERS.

Class II. *Time:* ½ hour.

Aim. To explain the definition of a river.

Apparatus. A rough model of a mountain in hard mud or clay in playground. Water in a pot.

	Lesson.	*Blackboard.*
1st Stage. Connect with previous knowledge.	Tell the children the subject of the lesson—rivers. Ask if they have ever seen a river; and, if so, to name it. If there is no river near school, take a canal or irrigation furrow for starting-point. Elicit from children that it is a stream of moving water, flowing in one direction between banks.	
2nd Stage. Movement and direction.	Ask why it moves. Probably the answers will be unsatisfactory. Pour some water on the model mountain and then ask why it is moving. Elicit that it is falling downhill. Say this is the case with river water too. It starts from high ground. What do we call high ground?—Mountains. Elicit rivers start from mountains, and keep on flowing to lower; give the place from which they start.—'Source.' Ask where the water comes from in the first place. Children probably say rain. Say this is right, but rivers also flow in dry weather. This water comes under the ground. (If children know of snow, introduce melting of snow as third source.)	Rivers start fro high ground mountain an flow down,
	State that the lowest ground is around the sea, so the rivers flow into the sea. The end of the river is its 'mouth.'	into the sea,
3rd Stage. Growth of rivers in their course.	Again pour water on the model mountain in two or three places, and show how the streams unite. Say it is just the same with real rivers. Those flowing from the same or neighbouring mountains often unite before	often uniting with each oth on the way.

	Lesson.	*Blackboard.*
	reaching the sea. Elicit that rivers grow bigger as they near the sea.	
th Stage. neralisa- ion.	Elicit definition or description of a river as a stream of water flowing from a mountain downwards till it reaches another river or the sea.	

B. *The same lesson, notes simplified for school use.*

N.B.—Model of mountain. Water in pot.

	Blackboard.
) Ask for name of river. Elicit water moving in one direction between banks.	
) Why does it move? Pour water on model. Elicit water is falling downhill. So starts from high ground—Mountain. Where does it come from?—Rain, springs, snow. Say lowest ground is beside the sea. Give 'mouth' of river.	Rivers start from high ground or mountains and flow downwards, into the sea,
) Pour water on model in three places, so that the streams join. Elicit rivers grow bigger as they near their mouths.	often uniting with each other on the way.
) A river is a stream of water flowing from high land or mountain downwards till it reaches another river or the sea.	Write this on blackboard.

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